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ORIGINAL COMMUNICATIONS.

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NEW TECHNIC FOR THE REMOVAL OF INTRINSIC GROWTHS OF THE LARYNX.*

DR. ROBERT CLYDE LYNCH, New Orleans.

Since the discovery of the laryngoscope by Garcia in 1854, it has been the keen desire of laryngologists to relieve the larynx of its vicissitudes. When Lewin, Von Brunson, or Walker removed the first tumor from the larynx by the aid of a mirror through the natural passages, what a great step forward was made from the older methods of their blind removal by forceps and finger? The discovery of general, and then of local anesthesia marked another epoch in the climb to treat the larynx in a more surgical manner with an ever increasing regard for its function after the primary relief had been obtained.

Such procedures, practiced in the manner known so well to you as the indirect method, carried with them an element of personal equation both as to patient and doctor, hours of throat education, tolerance for anesthesia—especially local—and the peculiar physical phenomena that present at the very last moment, to defeat that most trying, most exacting procedure known to surgery—the removal of a papilloma or fibroma from the vocal cord.

So unsatisfactory, and in a way unsurgical was the method, that the masters of our work sought continuously newer means to deal more accurately and scientifically with these conditions, and if possible to eliminate the multitude of difficulties that usually present

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during the progress of indirect operations. Many short-comings developed from the improper interpretation of the point of attachment, size, shape and extent of the new growth; and because of these inaccuracies, as well as those that developed after the grabbing type of operation, all were seeking for something more definite.

Figure 1. Arrangement of patient, operator, assistants, anesthetist, suction tube, etc., taken during dissection of papilloma.

To mention Killian, Bruenings, Jackson and Ingals is sufficient to acquaint you with the method of direct laryngoscopy, and the remarkable growth and improvement in this later step, though far more accurate and possibly less difficult is not without its own de-

ficiencies. Lastly, by accident, Killian discovered the possibilities of suspension and with his careful study presented to the world the suspension laryngoscope. The latter apparatus removes all of the greatest obstacles to direct laryngeal inspection, and now opens up new methods of study, diagnosis and surgery, for the relief of the various conditions to which the larynx is heir.

From a surgical standpoint our efforts are directed mainly against the removal from the larynx of the various tumor-formations both benign and malignant, to which it is liable. As the indications for treatment are quite plain it remains then for us to develop such methods as appeal to us individually or collectively as ideal, or nearly so, as is within our imaginations to conceive and execute.

The type of instrument that has served us up to this time is some one of the hundred varieties of forceps, be they pinching, biting, punching, or the double curette—dull or sharp, etc. Briefly, the technic is to grab more or less accurately, and pull, or twist, or both, let come what will—and therein lies the most unsurgical part of this type of surgery. We should criticise our colleague, the laparotomist, or gynecologist, for such a method in dealing with similar lesions in his domain. I hope to convince you that the way is now clear to deal with the larynx in exactly the same manner as our brothers do in other parts of the body; and with the instruments I will show you I can dissect accurately, ligate bleeding points, cover raw surfaces by sutures, and do plastic work with almost as much ease and quite as much accuracy, as my brother surgeon who works in the vagina, rectum, or abdominal cavity. The suspension laryngoscope is necessary to all this work and I use it in its simplest form, with an improvement that to me is essential.

The primary requisite is perfect quiet of the part, so that the selection of an anesthetic and above all its administration is most important. For all procedures that are to be somewhat prolonged and in all children, I much prefer a general anesthetic, though I have kept one patient on the suspension apparatus for one hour and ten minutes under local anesthesia, perfect comfort during the whole time.

In local anesthesia with the patient in the sitting posture, administer a morphin scopalomin tablet of appropriate dose one hour before the operation. Then apply to the uvula and post-pharyngeal wall a 10 per cent cocain solution with such care as to avoid gagging or coughing; to avoid these reflexes at the start is to have comfort and quiet throughout the performance. Follow this with three drops of the same solution from a laryngeal syringe upon the epi-

glottis, and wait three minutes requesting the patient to avoid swallowing and to spit out the excess. Next application, five drops into the larynx over the cords and down the trachea, requesting the patient to cough out the excess. From the sitting posture, the patient is then put upon the table, the speculum introduced carefully and quietly, adjusted perfectly and slowly, and the larynx tested with a cotton mop. If not perfectly quiet, more cocain of the same strength is applied until anesthesia is perfect and we can then proceed to work.

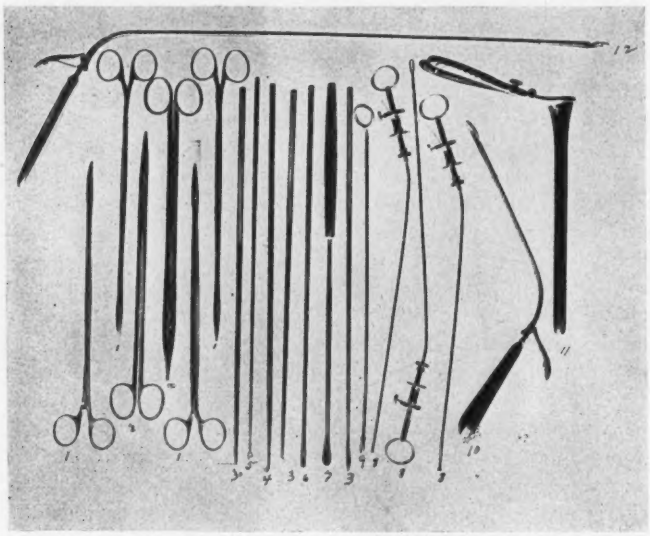

Figure 2. (1) Artery forceps, curved and straight. (2) Scissors. (3) Knives, right angle, obtuse angle and straight. (4) Curette. (5) Knot-tyer. (6) Needle holder. (7) Periosteotome-blunt dissector. (8) Killian baby forceps. (9) Sponge holder. (10-12) Tilting mirrors. (11) Lynch larynx speculum.

I have removed a single, pedunculated fibroma, multiple papilloma, vocal nodules, and specimens for microscope in adults, with complete satisfaction to myself and comfort to my patients with this method of anesthesia.

General anesthesia is more satisfactory for malignant tumors, papilloma in children, for plastic work, and is essential in all cases where perfect relaxation of the parts concerned cannot be secured by local means. I select ether in every instance, administered with

the Cain-McDermott warm ether-vapor apparatus, under the supervision of a trained anesthetist.

As perfect quiet is of greatest necessity, I insist on my patient being kept continuously in the surgical stage of anesthesia, securing perfect relaxation of the parts, conducing to the most accurate work, and surrounding the patient with that type of anesthesia which we recognize as the safest.

Crowding the patient under to the limit and working during the period of recovery—and if that period is too short crowd under again—is to my mind neither wise nor safe. This type of anesthesia will develop for the operator many disturbances just at the wrong time, and is surely most dangerous for the welfare of the case. I caution you against it.

As our experience increases with the use of the warm ether vapor, we are realizing that the tracheo-bronchial irritation following the use of this drug is decidedly overrated—none having occurred in nearly sixty anesthesias of this type. In order to eliminate the reflex element in the larynx even under general anesthesia, I paint the parts carefully with a 10 per cent solution of cocain, using only one application, taking particular care that none reaches the trachea, heeding Jackson's advice regarding the cough-reflex in larynx operations. I then prepare the field by painting these surfaces again with 20 per cent solution of argyrol freshly prepared. Whether this limits or prevents infection I cannot say, so far I have had none and I am inclined to think I get less inflammatory reaction.

I find some form of suction-apparatus necessary to take away the secretions that come from the salivary glands and esophageal mucosa, also to care for what bleeding occurs, and one can, with ease, pick up small fragments of tissue that may drop and remove those blood-clots that form and lie on the posterior wall of the trachea. The careful use of the suction tube for cleansing purposes as against sponges, eliminates one of the factors of traumatism, to which so little attention has been paid in laryngeal work, besides giving the operator the cleanest field possible for his manipulations.

To secure a perfect view of the entire interior of the larynx including the anterior commissure, I have found it necessary to modify the original apparatus of Killian and Albrecht in only two ways: 1. The limit of motion in the horizontal of the traveling crane or gallows is entirely too short and to obviate this, a table top is so constructed as to have a projecting platform twelve inches long and four inches wide; the remaining width of the top being hinged to drop at right angles. This removes the necessity of dragging the

patient on the table and disarranging the sterile coverings, and allows the proper placing of the crane to give twelve inches more of motion for adjustment to proper view. 2. The mechanism of the tooth plate of the mouth-gag is bad, it sticks and jams and the range of motion, ¼ inch, is entirely too small to suit all cases. My modification now allows one inch more room in the vertical, and one in movement in the horizontal—the latter being controlled by a screw which will not stick and can be adjusted properly and quickly. This allows me to use shorter tongue plates and does away with the epiglottis holders of Albrecht and Freudenthal.

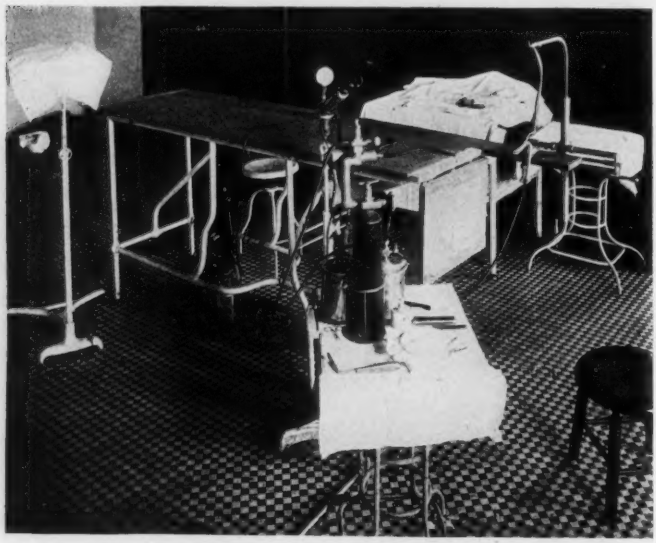

Figure 3. Table top, ether apparatus and suction apparatus under table.

Having obtained a perfect view of the larynx with that organ and its owner quiet I proceed as follows: In vocal nodules I pick up the affected cord gently, turn it nearly to an angle of 45 degrees that I may see its under-surface, using for this purpose the baby forceps of Killian. If the nodule is of the pin-head type, I pick it off with the Killian baby double cup-forceps. These are so small that they can be applied as accurately as one would pull a single hair from a follicule.

If the growth occupies the superior surface and is seen to involve mainly the sub-epithelial structures, I split the surface layer with

the knife and pick out the small tumor with appropriate forceps, reapplying the surface membrane and dressing the wound with the tincture of benzoin compound which will cover the area as collodion would on the skin surface. Absolute rest to the voice for 48 hours will show the wound healed and practically free from inflammatory reaction. Two cases operated on in this way have had clear tones restored and no recurrence thus far—five months.

In single pedunculated tumors, I proceed by picking up the tumor with the forceps, encircling its base with a wedge-shaped incision and remove it by clear dissection with a knife. In one case operated on in this way, quite a raw surface was left, which I closed by stitching—using the finest plain catgut. I believe this to be the first instance on record of stitching in the larynx through the mouth, and the results were a perfect healing, with as little reaction as one sees in a skin wound healing by primary union.

This to me is far more surgical than the older method of removing by tearing, pulling or twisting forces which must obviously carry with it adjacent normal mucous membrane, leaving a surface to heal by granulation and producing a scar of more or less size, the contraction, perhaps, interfering with the normal function of the part.

Single papilloma are grasped with the forceps and shaved off below the level from which they spring. One case of this type left but little raw surface, healed kindly, and has not recurred. I have often wondered why multiple papilloma recur with such tenacity. The same tumors appearing on the skin and having the same histological characteristics are removed by the dermatologist without recurrence unless the procedure is not complete, when they will recur with the same frequency as occurs in the larynx.

Upon reflection, do you think it at all possible to remove multiple papilloma from the larynx with any one or all of the forceps in the shop? The very nature of the instrument prohibits this. Guarded punch forceps or double curettes cannot remove every vestige of a papilloma, any more than they will peel a tonsil entirely from its capsule. Selecting this latter site where the mass is large and easy to reach, you know that the complete morcellement of the tonsil was impossible, and you have seen tonsillitis after such procedures. Accepting this, is it not more than likely that papillomata show this very marked tendency to recur, because they have been incompletely removed? To illustrate:

Case 1: Mrs. Z., Italian, a patient of one of our Fellows, suffered from multiple papilloma involving false and true cords on both sides. Sub-glottic area left side. She was under numerous sittings for re-

moval by direct methods with alcohol applications in between. For two years this continued. On account of change of residence she was referred to me. At first visit she was five months pregnant, larynx still involved to extent stated above. Two attempts at removal by direct method using Jackson speculum and plain forceps resulted in nothing but postponement until after delivery.

She returned in one year, instead of after delivery, again four and one-half months pregnant. Larynx about as I saw it on first examination. Under ether and suspension, I grasped the mass with

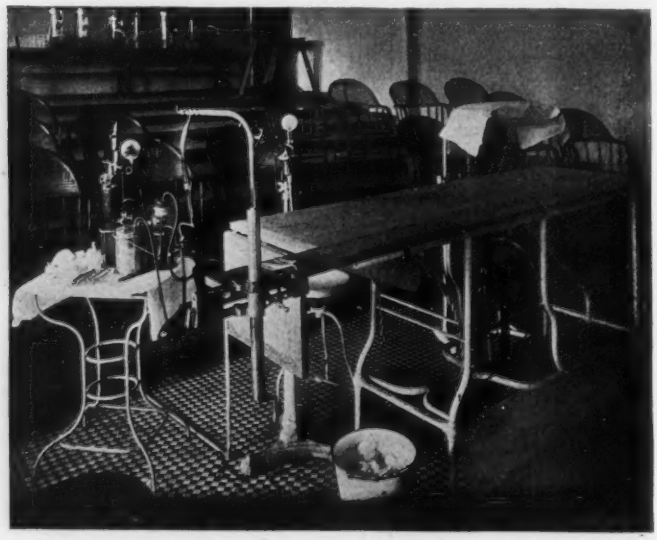

Figure 4. View showing increased movement laterally of traveling crane.

Killian baby forceps and proceeded to dissect cleanly the entire area involved. It was found after finishing above the cords that the sub-glottic space on the left side was involved. This mass was peeled off below its level of growth the same way. Fearing lest I should leave some small portion behind, I curetted gently the whole surface including the sub-glottic area. This was then swabbed freely with grain alcohol. To my amazement there was practically no shock, but slight inflammatory reaction, and on trial the second day, a very fair voice for the first time in five years. Recovery was complete with voice of full, clear tone. Delivery occurred in time. This

patient presented one month ago for examination, again two months pregnant, with absolutely no evidence of recurrence. She has had no treatment, either local or constitutional, and is now pregnant with no papilloma.

Case 2: D. B., Colored; a shouting church member: multiple papilloma of larynx: hoarse for two years. First attempt over a year ago with direct method and forceps, voice hoarse after operation, return to aphonia after two months. Second operation seven months ago; cocain anesthesia, suspension, complete removal by dissection and curettage of base. Application of grain alcohol: patient reported early in May, 1914. Voice clear; cords white, no recurrence. Still shouting.

Case 3: "Buster," 3 years old, brought to clinic with marked laryngeal obstruction and cyanosis. Immediate tracheotomy. Diagnosis multiple papilloma practically filling larynx. I could not see by direct inspection the opening into the trachea. Six months of laryngeal rest with the hope of spontaneous disappearance; no change in growth whatever. Five trials at removal under ether by direct speculum and forceps—very rapid recurrence. Thyrotomy with removal of mass—this in a child of 3, with a very short, fat neck and a tracheal cannula in place as the only breath way—was undoubtedly the hardest task I have ever had and I am sure, because of the difficulties, the procedure was incomplete—the result was a complete failure. Two trials with fulguration, masses seemed less for period of three weeks then resumed their usual appearance. Second period of rest for three months. Under ether and suspension, the masses were removed by dissection, curettage of base and application of alcohol. Respiration re-established through larynx. Cannula removed in twenty-four hours, voice in thirty-six hours, and so far no recurrence. Here again the reaction of inflammation was surprisingly slight, even though with my larynx speculum, I removed and curetted papilloma from the trachea and removed granulating masses from the point of entrance of the tracheotomy tube. It has been nine weeks since this last procedure. The tracheal wound is firmly closed and the little fellow is happy, with a very good voice in spite of his "surgical career." He is being kept in the institution merely for observation.

Albrecht writes of curetting papilloma, (*Journal of Laryngology*, February, 1914). This is the only reference I can find. He uses the forceps for removal and curettes the base. He has had some recurrences, and therein illustrates the difference between forceps removal and my removal by dissection. You will be surprised to find how

easy it is to do this. The technic is in no way difficult or complicated.

I believe I am the first to remove completely by dissection through the mouth an intrinsic epithelioma of the larynx, without external incision, delivering the tumor in one mass upon a cartilaginous plate. The microscope verified the diagnosis and also the fact of its total removal.

Case 4: Mr. B. applied at the Eye, Ear, Nose and Throat Hospital at New Orleans, because of a hoarse voice which had existed for five and a half months. He is 54 years old and rather thin,

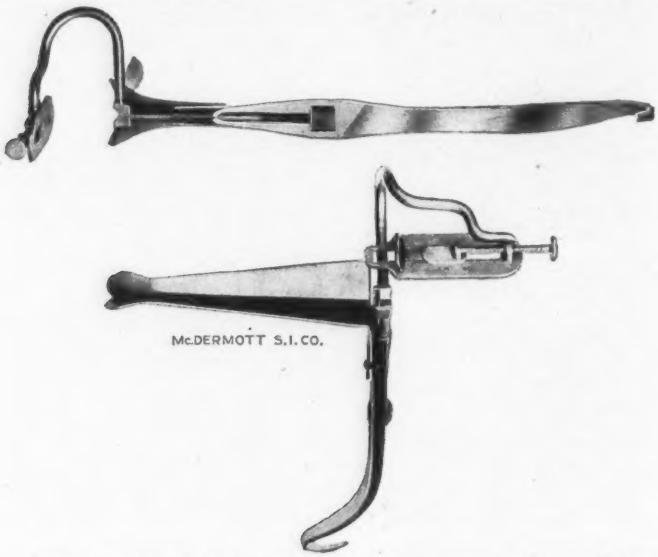

Figure 5. Modification of tooth-plate of mouth-gag to allow one inch more motion in horizontal. This allows use of shorter tongue plates.

though active and in good health. He complained of gradually increasing hoarseness, slight shooting pains in the left ear, and the desire to cough occasionally, having at times upon extra exertion, some noticeable dyspnea. Examination: Ears, nose, epi, -meso- and hypo-pharynx normal, two carious teeth, some pyorrhea, tongue normal, right half of larynx normal, left vocal cord replaced by grayish-white new formation disposed to extend towards venticle, occupying the whole cord from the vocal process to the anterior commissure. No glandular enlargement. Slight lagging of left arytenoid, though no change could be noticed in membrance covering this

cartilage. He swallows with comfort though at times there is an apparent catch. Wassermann negative, no T. B. in sputum. Von Pirquet negative. K. I. gtts XXX tid for three weeks, which time was utilized in tri-weekly examinations. No change after K. I. Operation was discussed with patient and free consent gained to do as I thought best. I proposed to remove the mass through the mouth under suspension and had the following instruments constructed: Three knives, right angle, obtuse and straight, all double-cutting except last; periosteotome; needle-holder; knot-tyer; scissors; artery-forceps; mirror for examination of subglottic region and walls of trachea; curette.

Under ether administered by my special anesthetist I proceeded to examine carefully with the mirror from every angle, the size and extent of the growth. It was seen not to enter the ventricle but to extend for a distance of ¼ inch below the cord over the cricoid cartilage. The right side was entirely free from any involvement. You cannot imagine the source of satisfaction gained from this preliminary inspection, and I recommend it to you in all cases, whether you operate this way or not. At the same time the upper end of the esophagus was looked into so as to be sure that there was no extension in that direction. Our pathologist, Dr. W. Seeman, was at hand, ready to make rush section for diagnosis, and to assure me, if possible, of a complete removal. I made a vertical incision beginning about one-eighth of an inch to the right of the commissure cutting through the right cord to the cartilage and extending the incision one-half inch toward the epiglottis. With the angular knife the incision followed the apex of the false cord curving posteriorly to the middle line. The periosteotome was inserted and with care I lifted the perichondrium from the left half of the thyroid cartilage, clipped off the vocal process of the arytenoid cartilage and continued the subperichondrial dissection on the cricoid until I could see that I was well below the tumor mass. The posterior vertical incision was then carried down with the scissors, the anterior with knife, and the lower transverse one was made with the straight knife and the tumor, surrounded by apparently healthy tissue, was removed in one mass on its perichondrial plate. Dr. Seeman reported in seven minutes the mass to be epithelioma and to be surrounded by normal tissue.

The raw surface was large, there was only little bleeding, the suction apparatus caring for it nicely. The wound surface was dried, inspected scrupulously for any suspicious point and the whole area painted with tincture of benzoin compound. Patient was put to bed,

flat, and watched carefully. Morphin grs. ¼ administered as soon as he began to be conscious from the anesthetic. You will find this to work well in preventing the period of excitement after anesthesia and in many instances to relieve vomiting. Perfect quiet was maintained, and upon awakening from the morphin he was cautioned continuously about coughing hard or straining. Ice bags were applied to either side of the larynx and in four hours, sterile water was taken with ease. In two days patient was up in bed, out on the third, and home on the fifth. Slight emphysema existed for twelve hours, but did not extend, and was only indistinctly felt. Wound was seen to granulate nicely, argyrol being instilled over the larynx and into the trachea every second day. In five weeks I could no longer recognize the slightest evidence of operation except the loss of the left half of "viscera of the larynx." It is now ten months since this procedure, and I cannot see the slightest trace of any recurrence. My patient is fifty-six pounds heavier, and though having a squeaking voice is, I hope, well.

Several points are offered you for consideration: The tumor is removed in one mass without being disturbed in any way by any instrument or manipulation. This is the accepted surgery of malignant tumors. This being accomplished without disturbing the integrity of the cartilaginous box, must diminish in a great measure the possibilities of a recurrence. If tumors of this class spread rather by contiguity of tissue than through the lymphatics in this locality and if we accept the fact that the invasion of this spread is resisted most strongly by cartilaginous tissue, we then have two very excellent reasons for expecting far better results than can be obtained by any procedure that begins by splitting the cartilage and thereby furnishing a gateway for invasion into the skin and sub-cutaneous tissues. Though brilliant cases of removal and cure of malignant growths of the larynx by punch forceps working through the mouth have been reported by Killian and Chappell, the method cannot appeal to your surgical sense in any way, and is directly against modern advice relative to the surgery of malignancy.

My experience with thyrotomy for cancer covers five cases one of which recurred, and this recurrence took place in the line of incision rather than through the lymphatics or by extension from either end of the cartilaginous box. I am certain that my experience here is not unique and I believe that this is the road of selection for the secondary invasion. Secondly: since the contour of the thyroid and cricoid cartilages are preserved in their normal state, the possibilities of secondary stenosis are most remote. One

is convinced of the impossibility of obtaining cartilaginous or bony union after thyrotomy, and Jackson advises against any stitching of these parts at all. Surely then, the dysphagia, the greatly increased dangers of infection, the long slow process of granulation, and most of all the incomplete and faulty approximations of these parts, speak either for recurrence or for stenosis. On the contrary all this is avoided by my technic and my patient has never had the least sign of obstruction, has a passageway that is beautifully wide, and that cannot now possibly contract to a degree anywhere near stenosis. On the other hand two of my remaining thyrotomies now suffer from a stenosis which demands the continuance of a tracheal cannula. One of these has recently submitted to a new plastic operation, and I now have great hopes of ridding him of his cannula and restoring normal breathing.

This operation and the subject generally is too recent for me to discuss at this time.

The time is quite near at hand, or to me has arrived, where we must discard our ancient methods of laryngeal work and formulate methods that are abreast of the trend of present-day surgeons. We are quite up to if not ahead of him in much of our nose, ear and pharynx work, but up to this time we have not, in a general way, changed the methods prevailing since 1861, when we believed a benign tumor of the larynx should be removed through the mouth with a mirror and forceps. I submit this to you for serious consideration.

624 Gravier Street.

Pathological Tonsil. H. MILLER. *Jour. Ophth. and Oto-Laryngol.*, March, 1914, p. 79.

Miller states that since the tonsils are situated above the horizontal portion of the palato-glossus and palato-pharyngeus, these muscles force them upward and outward toward the pharyngeal opening of the Eustachian tube, partially or completely occluding it. Secretions accumulate and produce complications within the ear. When the tonsils are low down in the fossa they may rest upon the dorsum of the tongue or exert pressure upon epiglottis and upper larynx, producing a reflex cough. ED.

LARYNGITIS SUBMUCOSA SUBGLOTTICA ACUTA.*

DR. CHARLES W. RICHARDSON, Washington, D. C.

Under the above name we recognize an acute catarrhal inflammation of the larynx affecting, to a great extent, the submucous layer of the subchordal portion of the laryngeal mucosa. This type of laryngeal affection has been recognized for many years, first having been described by Bayles in 1808, although through his description there was no clear differentiation between this purely catarrhal affection and the serious infiltration. As men began to differentiate this condition from edema and other allied affections, the inflammatory changes in the larynx of the more severe type, especially those affecting the submucosa, were given various designations. Thus Burow describes the condition as chorditis vocalis inferior; Von Ziemssen as laryngitis hypoglottica acuta gravis; Rauchfuss as laryngitis subchordalis acuta; Curveilheir as laryngitis submucosa subglottica; and Gottstein as laryngitis submucosa acuta. It has always seemed to me that the name applied by Curveilheir describes most accurately the affection, and for that reason I have employed it. Many authors still describe this affection under acute laryngitis and recognizing it as a more severe type of that affection. Early in my professional career, when I was doing a great number of intubations, I was brought in contact with cases which, while suffering from marked stenosis of the larynx with stridulous breathing, possessed, nevertheless, very few of the characteristic symptoms of true laryngeal diphtheria. Culture investigation gave a negative result in these cases. The use of the laryngeal mirror, to which I resorted early in the investigation of these cases and which can be employed at almost any age, enabled me to recognize the nature of the invasion in all subsequent cases which came under my observation.

These cases had been described as cases of false croup; as due to incurvation of the epiglottis—whatever that might be; as true cases of laryngeal diphtheria, in which the bacteriologists were in fault in not finding the Klebs-Loeffler bacillus; as strumous laryngitis and laryngitis stridulus.

Etiology: The most frequent cause of this type of laryngeal inflammation is the same as those that bring about the acute laryngeal

*Presented at the thirty-sixth annual meeting of the American Laryngological Association, Atlantic City, May 26th, 1914.

catarrh. In most cases we have only the evidences of a severe, acute laryngeal catarrh which has extended into the submucosa, localizing itself more intensely in the subchordal region of the larynx. Over-exertion of the voice during the existence of a simple laryngeal catarrh or re-infection from fresh exposure, is very apt to cause the extension of the simple into the more severe type of submucous catarrh. The exanthematous diseases,—scarlet fever, whooping cough and especially measles—may have this affection as a sequela. Foreign bodies, inhalation of various chemicals, irritating gases, acids, hot water, smoke, and steam may be the active mechanical cause of such a disturbance.

The whole interior of the larynx presents the characteristic evidences of an acute laryngeal catarrh, but it is in the subchordal portion that the characteristic lesion is seen. In a fair proportion of the cases that have come under my observation the hypoglottic portion of the larynx presented only a moderate degree of inflammation, the cords themselves only showing slight change in color. Below the vocal cords can be seen two symmetrical bright red masses, which approach towards each other so as to almost meet throughout in the middle line. Upon the degree of the subchordal swelling and the narrowing of the lumen of this portion of the larynx is dependent the intensity of the symptoms.

The affection manifested most frequently in children is usually ushered in with the symptoms of an acute laryngeal catarrh, hoarseness of the voice, soreness or tightness in the larynx, croupy cough, and stridulous respiration. These symptoms endure for from twenty-four to forty-eight hours, when they begin to partake of a more severe character in that the respiration becomes more stridulous and the breathing more embarrassed. The embarrassed respiration is more marked at night or when the patient is in a prone position. In the more severe cases the breathing becomes markedly embarrassed and attacks of suffocation ensue, the face becoming cyanosed with delirium and loss of consciousness, which finally deepens into coma and death, unless relief is afforded through intubation or tracheotomy.

One feature has always impressed me in this affection and that is that the voice is never markedly affected. It may be more or less hoarse but is never aphonic. The general symptoms are not very marked. There is usually some temperature between 100° or 102° F. The pulse is quick-bounding and full-volumed. The appetite is not much impaired, and most children—with only moderate interference with respiration—do not seem very ill and will per-

sist in playing, although their breathing is quite stridulous. The general facial appearance is fair, and, while the character of the breathing sound would lend the belief that there is considerable interference with the exchange of air, it is not manifested from the appearance of the color of the face. The diagnosis is made through the examination of the larynx with the laryngeal mirror. The differentiation of this condition from diphtheria is readily made The laryngeal diphtheritic is usually very ill, has only a very moderate temperature, a slow, soft pulse, is usually pale and quite anxious, and manifests no desire for food. The stridulous breathing is not uniform, being attended with occasional paroxysms of extremely difficult respiration.

In subchordal inflammation the child has not the appearance of being seriously ill, usually has fever, a full, firm-bounding pulse, the facial expression is good and the color not altered, the stridulous breathing is quite uniform, if anything gradually and progressively growing worse, with only occasional paroxysms of difficult breathing.

In laryngeal diphtheria the inspection reveals the presence of false membrane, and the result of culture examination shows the presence of the Klebs-Loeffler bacillus.

In subchordal inflammation the inspection demonstrates the presence of the bright red bands immediately below the vocal bands, more or less approaching the middle line. The culture examination is negative.

In most cases the progress of the disease is marked, first, by an apparently severe attack of acute laryngitis, which lasts for about twenty-four hours, when the stage of strident breathing becomes manifest. With the stridulous breathing we also have the cough becoming more bellowing in character. This stage usually reaches its maximum of intensity within thirty-six hours. The retrocession of the process varies from twenty-four to forty-eight hours. Many of the mild cases, except for the alarming cough and strident breathing, would give no anxiety. The children are not very sick and are anxious to be about their usual habits of life. Several children in such condition have been brought to my office for consultation. In these mild cases, although the breathing may seem to be markedly impaired from the character of the stridor and the pictures of the subchordal swelling, the countenance is quite ruddy and the lips of the normal red tinge. In the more severe types, when the breathing begins to tighten up, the progress of the case from bad to worse is

very rapid and we then have the usual picture which is manifested in laryngeal stenosis, however produced.

The prognosis is very favorable for complete recovery. The mild case, if seen early enough and recognized, should, under appropriate treatment, respond rapidly. Unrecognized, neglected, or cases seen at first in the severe form, should, under appropriate surgical and general care, make complete recoveries. A fatal termination is rather unusual.

Treatment: The child should be kept abed in a warm room in which steam is generated. Where steam heat is employed, this can readily be accomplished by allowing the valve on the radiator to be slightly opened. The diet should be restricted to liquids and the bowels kept well opened by calomel and salines. Locally the larynx should be touched with a 1 per cent solution of silver nitrate once a day, if the child be old enough to permit the application being made. An ice bag should be worn over the larynx continuously. I always give ammon. bromide and carbonate with tincture of aconitis internally. If the breathing become very stenotic, intubation becomes necessary. If it become labored over many hours, I believe intubation should be done to relieve the little sufferer. In one case I fear I delayed this relief quite to the danger point.

I will close the consideration of this subject with the history of four cases, so severe in their character that they necessitated surgical intervention.

On December 5, 1890, I was requested by Dr. Price to see his two children who were suffering from laryngeal diphtheria, with marked obstruction to their breathing. The children were 5 and 7 years of age, respectively. They presented all the evidences I had learned to connect with the existence of laryngitis submucosa sub-chordalis. Examination of the larynx proved my conclusion to be correct, but, in order to prevent a possible error in diagnosis, a culture was made in both cases. The children were put to bed in a warm room, with moist air, a saline purgative given, an ice bag applied over the larynx, and the following administered internally:

Ammonii bromidi	1.00
Ammon carbonates	1.00
Tincture aconitis	.50
Glycerinae	8.00
Aqua	62.00

Sig: Teaspoonful every twenty minutes until six doses are taken, then every two hours.

The morning of December 6, I received notice that the cultures were negative. About noon of this day I saw the children. The older had improved greatly but the younger was not so well. The breathing in the younger child was more stridulous, the "riding" of the larynx was more marked and the sinking of the supra-clavicular spaces and supra-sternal notch more marked. It had grown very restless. Although its color was good and I thought it still had a good chance for avoiding intubation, I introduced a tube at the urgent request of the father. The child was *ex tube* in five days. Both children recovered.

In April, 1894, I was requested by the late Dr. W. W. Johnston to see a case of laryngeal diphtheria, in which he had received a negative culture. The laryngeal examination on this two-year-old child was negative as to diphtheria, so far as the inspection could be made. The hypo-larynx and the cords could be fairly well seen but it was impossible to view the subchordal portion of the larynx. Although the breathing was quite distressful and the child very excitable it was thought desirable to delay intubation. As Dr. Johnston was firm in his views as to the diphtheritic nature of the invasion, three thousand units of antitoxin were given and the usual treatment instituted. I spent the night with the child. We decided at 10 a. m. the following morning, on account of the increased difficulty of breathing, to intubate the child. The tube was removed on the fifth day. Several subsequent cultures were made with negative results.

March 22, 1898, I was called to see a case of difficult laryngeal breathing, the patient being under the care of Dr. R. T. Holden. Dr. Holden stated that the child, 7 years old, had passed through a moderate case of measles. When convalescence was nearly assured, it contracted an acute laryngitis, which, for several days, had grown gradually worse. For two days the breathing had been very bad. Cultures negative. At 10 o'clock he asked me to come and intubate, as the child was growing weary from the continued effort at breathing. At 1 p. m. I reached the patient's home. Breathing was very labored and the countenance was slightly cyanosed. I made a laryngeal inspection and found the characteristic picture. The effort of examination was followed by an intense paroxysm of difficult breathing which made it necessary to resort to immediate intubation. The child was extubated in six days. This case was most interesting from the almost normal character of the voice.

In November, 1912, I was summoned by Dr. S. S. Adams to the telephone at 11:45 p. m. From the character of his voice and his

spoken words I knew delay meant death. I responded to his summons with great rapidity, and, had I been a few moments later, I would not have been needed. This case is most interesting, from several points of view. When this child was 4 years of age, I saw him in a similar attack, from which he recovered through the treatment then instituted. In the latter illness, which occurred when he was 9 years of age, the symptoms were identical with his former attack, and Dr. Adams treated him for several days. This second invasion occurred as a sequela to measles. On Sunday, as his breathing had become very labored, and as the boy complained greatly of his want of air, Dr. Adams requested me to see the patient with him at noon. His breathing at this time was quite strident, his cough extremely bellowing and constant, but his countenance was of good color, although beaded with drops of perspiration.

Another interesting feature in this case was his almost normal voice. The picture of the larynx was a perfect one of laryngitis subchordalis. His eye and general condition, as well as his recovery from his previous attack, caused us to hope that he would tide over this attack without resorting to extreme measures. He gradually grew worse, as the parents informed us, until about 11 o'clock when he became delirious, and this excited their gravest apprehension. When I reached the patient, I was truly astounded at his perilous condition. He was profoundly unconscious, intensely cyanosed, and simply gasping an occasional breath. I only took time to introduce the gag and quickly drove home the intubation tube as he lay prone in the bed. A few efforts at artificial respiration started up the rhythm of breathing again. He was extubated in five days. Uneventful convalescence.

These four cases will be sufficient to indicate the gravity which this condition sometimes assumes. I have, in all, intubated eight times for subchordal laryngitis. Most of the cases which I have seen in consultation have, under the appropriate local and constitutional treatment, subsided without resorting to surgical intervention.

1317 Connecticut Avenue.

PRIMARY SARCOMA OF THE TRACHEA.*

DR. J. M. INGERSOLL, Cleveland, Ohio.

In 1906, Dr. C. F. Theisen presented a paper on "Tumors of the trachea" to this association. This paper is so complete and comprehensive that, with his permission, I shall quote some parts of it:

Dr. Teisen says, "Tracheal cancer appears to favor the male sex; out of the cases collected by the writer, men were afflicted about twice as frequently as women. The youngest patient was 28 years old, the average, however, being from the fiftieth to the sixtieth year. Many more cases occur between these years than between the thirtieth and fiftieth.

"The favorite seats for primary tracheal cancer are the upper parts of the trachea and the lower parts, close to the bifurcation. The middle third is rarely involved.

"Although primary tracheal sarcoma is rarer than carcinoma, we have been able to collect eighteen cases from the literature. Gleitsmann has reported one of the few cases of tracheal sarcoma operated upon endotracheally. The tumor in his case, that of a man aged 52 years, was situated in the upper part of the trachea and nearly filled its lumen. It was as large as a small walnut.

"Both sexes seem to be equally afflicted with tracheal sarcoma and young people rather more frequently than persons more advanced in years. Occasionally the tumors are pedunculated. They often reach a considerable size and almost completely fill the tracheal lumen.

"A study of the cases also shows that the tracheal tumors are situated in the majority of the cases in the upper part of the trachea and less frequently in the lower part. They most rarely occur in the middle of the trachea. They are attached most frequently to the posterior wall, which is rich in mucous glands. This is particularly true of the carcinomata, which appear to take their origin from these mucous glands.

"The rarity of tracheal tumors becomes much more striking when the eighty-nine benign and forty-six malignant tracheal tumors are compared to the 10,747 benign and 1,110 malignant laryngeal tumors which Semon collected between 1862 and 1888.

"The malignant tumors of the larynx represent only about 11 per cent of the total number, while in the trachea, according to the cases collected by the writer, they represent about 50 per cent of the total number. These figures are significant because they show that a strong suspicion of malignancy must always attach to a tracheal tumor.

"The fibroma or fibrous polyp is usually pedunculated, and Schroetter has reported a case of a distinctly pedunculated sarcoma which was freely movable. In Proebsting's case an apparent polyp with a long pedicle, which had been coughed out, was found to be carcinomatous.

*Read at the thirty-sixth annual meeting of the American Laryngological Association, Atlantic City, May 25, 1914.

"Sarcoma usually occurs as a growth with a broad base and smooth surface. It grows slowly, sometimes becoming very extensive, however, and shows little tendency to ulceration.

"As statistics show that over one-half of all cases of tracheal neoplasms are situated in the upper third of the trachea, a low tracheotomy would relieve the patient's breathing in a majority of the cases."

Since Dr. Theisen's paper was written five cases of malignant tumors of the trachea, all of them carcinoma, have been reported. Dr. T. Passmore Berens reported one case to this Association in 1909. The other cases were reported by Kaunitz, Simmell, Eidesheim and Nager.

My own case was one of sarcoma of the trachea, in a man, 32 years old. When he consulted me he said that he had had a persistent, troublesome cough for several months and during this time he had had three very severe prolonged attacks of paroxysmal coughing. In each of these attacks he had finally coughed up and expectorated what he called a "polyp." He corroborated this statement by showing me the polypi which he had expectorated. They were irregular, slightly nodular masses. The smallest one was about 1.5 centimeters in diameter, the largest one was 3 centimeters long and 1 centimeter thick, tapering down to a small pedicle at one end.

His larynx was inflamed and on the left side of the trachea, just below the first ring, there was a pedunculated tumor, quite similar in appearance to the largest one which the patient had expectorated. At this time there were no indications of any involvement of the tissue around the larynx and trachea. Microscopical examination of the tumors, which the patient brought with him, showed them to be spindle-celled sarcoma and an external operation was advised. The patient, however, refused all operative interference.

His physical condition at this time was good but he soon began to have increased difficulty in breathing and rapidly lost weight. One month later he consented to go to the hospital on account of very marked difficulty in breathing and it was necessary to do a low tracheotomy on him the day after he entered the hospital.

Two weeks later he consented to an operation. Dr. G. W. Crile exposed the larynx and upper part of the trachea and found a broken-down mass of neoplasm extending so widely around the left side of the neck that he decided it was inoperable and the incision was closed.

For a short time after the operation the patient's condition improved somewhat. A little later he began to have difficulty in swallowing, probably due to involvement of the esophagus, became very much emaciated and died about seven weeks after the operation. No autopsy was permitted. It seems very probable that if the patient had consented to an operation when the diagnosis of sarcoma was first made, that a resection of the trachea could have been done and the whole tumor removed before it had extended beyond the walls of the trachea.

BIBLIOGRAPHY.

For a complete bibliography of tumors of the trachea, up to 1906, consult Dr. Theisen's paper published in the Transactions of the American Laryngological Association, Volume 28, page 264.

1. F. R. NAGER: Ueber das primaere tracheal Carcinom. *Arch. f. Laryngol.*, Bd. 20, 1908.

2. EIDESHEIM: Ein Beitrag zum Vorkommen primaerer boesartiger Neubildungen in der Trachea. Inaug. Discus., Liepzig, 1909.

3. T. PASSMORE BERENS: A Case of Primary Carcinoma of the Trachea. Trans. Amer. Laryn. Assoc., Volume 31, page 70.

4. E. SIMMEL: Zur Kasuistik des primaeren Karzinoms der Trachea. *Arch. f. Laryngol.*, Bd. 24, 1911.

5. PAUL KAUNITZ: Zur Kasuistik des primaeren Trachealkazinoms. *Wr. klinische Wchnschr.*, Sept., 1912.

1021 Prospect Avenue.

SPECIFIC NERVE DEAFNESS.

At the Massachusetts Charitable Eye and Ear Infirmary during Dr. Crockett's last service, I observed eight cases in which the hearing for the whispered voice had fallen to approximately 1/25 in both ears, while still showing a positive Renné. These cases all gave a double or triple Wassermann reaction. While some of them improved under intra-venous injections of salvarsan, there promises to be better results from a salvarsanized serum given intra-durally as suggested by Swift. These cases will serve as the basis for a more complete study later showing the end-results, while other material will be added to confirm or disprove the value of the hearing test as a diagnostic sign in specific nerve deafness.

FRANCIS P. EMERSON, M. D.

THE USE OF THE BRONCHOSCOPE IN DIRECT EXAMINATION OF THE LARYNX, TRACHEA, BRONCHI AND ESOPHAGUS.

DR. P. SCHOONMAKER, New York City.

The method of direct examination of the upper air passages has been practiced for many years. That of examination of the larynx trachea, bronchi and esophagus is of more recent date. Bozini, in 1807, examined the upper end of the esophagus. Later Kussman, Mikulitz, Gottstein, Kirstein, Einhorn and others devised instruments for the examination and treatment of the esophagus and larynx.

Gustav Killian, of Germany, in 1897, devised a bronchoscope and succeeded in removing a foreign body from the upper bronchus by means of forceps passed through a straight tube inserted into the bronchus; thus demonstrating the feasibility of upper bronchoscopy. Later he improved his bronchoscope and used it in lower bronchoscopy. These were the greatest steps in endoscopy.

In 1904, Chevalier Jackson of this country combined the lighting principal of the Einhorn esophagoscope with the tube of Killian's bronchoscope, with which he was able to examine the esophagus and stomach. In 1906 he described his gastroscope and reported a series of fourteen cases in which he had obtained results of value from gastroscopy, including twelve cases with lesions, one without, and one case of extraction of a foreign body from the stomach. Many improvements have been made in the instruments first devised, making their use more practical and satisfactory.

The brilliant work of Killian, Jackson, Ingals and others, in removing foreign bodies, has led to the impression that tracheobronchoscopy is useful for this only. At the present time the bronchoscope is used more and more frequently for direct examination, diagnosis and treatment of diseased conditions of these organs. By use of the naked eye with this instrument we are greatly aided in diagnosis and treatment.

In upper tracheo-bronchoscopy the tube is passed directly through the larynx and trachea into the bronchi. In lower bronchoscopy a lower tracheotomy is done, and the tube passed through the fissure directly into the bronchus. One should be prepared in every case to do a tracheotomy when necessary.

The method of direct inspection of these organs (trachea, larynx, bronchi and esophagus) for pathological conditions is of comparatively recent date, and has been of such wonderful assistance in the diagnosis, treatment, alleviation and cure of diseases of these parts, that we approach the subject with enthusiasm and commend this method of examination and treatment to the profession, hoping that they will further acquaint themselves with this method that added such brilliant result in laryngoscopy.

The x-ray and fluoroscope are of material aid in locating foreign bodies. With metallic substances the outlines are sharp and distinct, the character of the object defined, and its exact location outlined. In the examination for morbid growths the results are less definite.

In tracheo-bronchoscopy and esophagoscopy a local or general anesthesia may be used. The examination of the bronchi is perfectly feasible under cocain anesthesia, especially if a full dose of morphin and atropin be given. The morphin adds courage rather than anesthesia, and the atropin checks the secretion of mucus, that is so easily excited on any manipulation of the larynx and trachea and interferes with examination.

Chloroform is preferred to ether as a general anesthetic, as it excites less secretion than ether and can be more easily administered.

The new method of rectal anesthesia is ideal in many ways, as it does not interrupt the work or interfere with the operation, nor does it excite mucous secretion as with the other methods of anesthesia. I have used this method in work on the nose, throat, bronchi and esophagus with very satisfactory results.

Under cocain anesthesia the patient may be examined in an erect posture, but in general anesthesia the prone position should always be used.

The writer has employed the direct method for examination and removal of foreign bodies and morbid growths in the esophagus, trachea and bronchi, in structures and obstructions of the esophagus, in local ulcerations and inflammations in the larynx and trachea, and in securing specimens for microscopical examination.

The following histories are chosen to show the various cases in which the bronchoscope has been of invaluable use. In some of these cases the Schoonmaker bronchoscope was used with success after other instruments had failed.

Case 1: Papilloma of trachea. Louis N., age 26 years, born at Heidelburg, Germany.

History: When 8 years old he had diphtheritic croup, requiring tracheotomy, which was done by Dr. Czerny. The tracheotomy

tube was removed on the eighth day. Some days later he was suddenly taken with severe dyspnea; the tracheal wound was reopened without anesthesia. Tube removed in ten days and wound healed by granulation. He consulted me in 1912 for difficulty in breathing which he first noticed six years after the tracheotomy.

Examination: General health good. Thyroids enlarged. Cicatricial scar in lower part of neck in median line. Bronchoscopic examination revealed tracheal growth partially filling tube.

Diagnosis: Papilloma in site of cicatrix of tracheal wound.

Treatment: Some time later the elongated papillar growth was destroyed with a specially made electric cautery tip, only one application being required. He has remained free from dyspnea since cauterization.

Case 2: Bone in esophagus. Harry K., age 36 years, Harlem Hospital, November 4, 1913.

History: On November 1st, while eating soup with noodles, swallowed a hard substance, which caused severe pain. He went to his physician who told him that the object had passed into the stomach, and that the pain was due to irritation of the esophagus. Four days later he was admitted to the hospital complaining of pain and inability to swallow solid food, and liquids were swallowed with difficulty. Had constant pain in median line over upper part of chest. Felt sure he had swallowed a piece of bone. X-ray examination was unsatisfactory, but showed dark object in esophagus opposite fourth or fifth dorsal vertebra.

We attempted bronchoscopic examination under cocain anesthesia. Object was seen deeply embedded in esophagus which was congested and swollen. The object was seized with the forceps and four unsuccessful attempts made to remove it. Patient nervous and much exhausted and bleeding obstructed the view.

The patient was put to bed, and two days later (eight days after the bone was swallowed) rectal anesthesia was administered by Dr. Lumbard, the esophageal tube passed and bone removed with difficulty, the forceps slipping off several times. The bone was triangular in shape with sharp edges and corners, one-quarter of an inch thick by one eighth, and one inch on side and base. Patient became cyanotic during operation and a lower tracheotomy was done by Dr. Haynes. Recovery uneventful.

Case 3: Pin in larynx. Mrs. F. E. S., age 30 years, referred by Dr. Steel.

History: While dressing, she placed some pins in her mouth; during a fit of laughter she aspirated one into the larynx; this

caused severe dyspnea and coughing, and pain in swallowing and talking. Her physician was unable to remove the pin, and brought her to Dr. Steel who referred her to me.

Any attempt to examine the larynx with the laryngeal mirror caused severe pain and dyspnea with spasm of epiglottis and larynx, and I was therefore unable to get a view of the parts. Under thorough cocain anesthesia, I was able to use the split spatula of the Schoonmaker bronschoscope, draw the epiglottis forward, this brought the pin into view. It lay between the vocal cords, the sharp point embedded in the thyroid cartilage and its round head beneath the epiglottis. The pin was grasped with the forceps and easily removed.

The position of the pin readily accounted for the severe spasms on any motion of the parts in talking or on manipulation.

Case 4: Esophageal cancer. William B., age 40 years, referred by Dr. B., June 20, 1911.

History: Some three months ago he had some trouble in swallowing. This increased gradually until he was unable to take solid food, and liquids were taken with difficulty. He was losing weight and looked pale and anemic.

Physical examination failed to establish a diagnosis. He was placed in the Post-Graduate Hospital and kept under observation for a few days. The x-ray showed dilated esophagus in middle third with constriction and morbid growth in lower third. Examination of specimen secured by punch-forceps passed through esophageal tube of bronchoscope showed it to be carcinoma. Obstruction soon became complete and patient was unable to take liquids. A gastrostomy was done and food administered through canula. Patient rapidly failed and died two months later.

Case 5: Gold crown in right main bronchus. George B., age 72 years. Case brought to Post-Graduate Hospital by Dr. Quimby, October 27th, 1913.

History: While having gold crown placed on tooth, suddenly gasped and crown disappeared; coughing followed. Flouroscope showed crown in main bronchus open side up. Removed by Dr. Forbes under cocain anesthesia, 20 per cent, to larynx. No. 11 bronchoscopic tube passed, crown seen open end up. On second attempt it was seized with forceps and removed with bronchoscope. Remained in hospital over night. Was seen on October 29. Old bronchial rales present but no edema or irritation. No complications. This case was interesting in that the crown could be seen to move up and down as patient exhaled and inhaled.

Case 6: Open baby-pin in right bronchus. Martha G., age 13 years, December 1, 1913. Case referred by Dr. P. from family physician, with a history of having swallowed pin two days previous to operation. On the evening of the following day was admitted to the Post-Graduate Hospital. There was then no change in her voice. The next morning an x-ray picture was taken, showing the object to be in the neck, median line, lower end at about level of tracheal ring. Dr. P. asked me to be present as he thought object to be in upper esophagus and easily removable. Laryngeal examination before anesthesia failed to show object. Under ether, Dr. P. was unable to feel object with finger or reach object with ordinary forceps, therefore a noll tube was passed into esophagus and to stomach; no object was found; there was no trouble with respiration. It was thought to have passed into stomach. As a precaution, a No. 9 tube was passed into trachea and object recognized in right bronchus and removed by Dr. Forbes.

Case 7: Five-cent piece in esophagus. Clara G., age 17 months, admitted to children's ward, Post-Graduate Hospital, September 10, 1913.

History: Four days previous to admission swallowed a five-cent piece. Was unable to swallow solid food. X-ray examination showed object in esophagus. Under ether anesthesia object was easily removed with esophagoscope by Dr. Forbes. Uneventful recovery.

Case 8: One-cent piece in esophagus. Rudolph P., age 7 months, admitted to children's ward, Post-Graduate Hospital, August 25, 1913, care Dr. Forbes.

History: Swallowed one-cent piece three days previous to admission. There was difficulty in swallowing; regurgitations of milk. X-ray examination showed object. Unsuccessful attempt made to remove object without general anesthesia. Under ether anesthesia, object removed by esophagoscopy. Uneventful recovery.

Case 9: Safety-pin in esophagus. Murial Z., age 7 months, referred by Dr. S. Lloyd, May 6, 1913. Patient swallowed safety-pin four days previously. X-ray examination showed open safety-pin in lower end of esophagus. Under ether anesthesia, pin seen clearly; unsuccessful attempt made to close pin and turn it through tube. It was pushed into stomach and removed by gastrostomy. Uneventful recovery.

Case 10: Metal pin, composition head, in trachea. Anna P., age 25 months, January 20, 1912. Admitted to Post-Graduate Hospital, under Dr. Forbes.

History: Swallowed pin five days previous. While playing in crib, sudden cough and cry. Mother put finger in back of mouth and felt sharp object as edge of pin. There was no trouble for two days, then there was coughing and expectoration of blood. Was taken to Hospital where x-ray examination located pin in trachea, head in bronchus. Two attempts were made, using Jackson instrument, but results unsuccessful.

On day of operation, June 20, seen at noon and operated at 4 p. m. Looks septic. Under chloroform, unable to locate object by direct examination, mucus and blood present, point of pin not seen. Tracheotomy (upper) done; pin was coughed out immediately through wound.

Subsequent history was one of a septic character. Patient's serum given auto-vaccine. There were multiple abscesses. Discharged from hospital two weeks later much improved; but one week from date of discharge, through an unfortunate accident, died.

Case 11: Tack in right bronchus. Morris J., age 34 months. Admitted to Post-Graduate Hospital, April 13, 1913.

Diagnosis: Right lobar pneumonia. Treated for this condition; fever, cough, expectoration with blood; looks chronically sick. April 20: Dullness over entire right lung posteriorly at apex and base; voice and respiratory sounds distant. Aspiration of pleura negative. April 23: Mother spoke of child possibly having swallowed tack. X-ray picture taken, showing tack in second division of right bronchus, head downward.

April 25: Dr. Forbes attempted removal unsuccessfully with Bruenings' bronchoscope, as instrument failed.

April 27: Operation with Schoonmaker bronchoscope: Foreign body seen, and removed under chloroform anesthesia. Brass-headed furniture tack. April 29: Respiration normal. April 30: Slight edema of old infiltration of lung. May 4: Discharged.

The interesting factors in this case are, a foreign body in bronchi causing pneumonia. The accuracy of the x-ray in locating and clearly defining the foreign body. The immediate improvement and final recovery after its removal.

Broadway and Eighty-sixth Street.

SYMPOSIUM--BACTERIN TREATMENT.*

THE USE OF BACTERINS IN THE TREATMENT OF DISEASES OF THE NOSE AND THROAT.*

DR. FIELDING O. LEWIS, Philadelphia.

Vaccine therapy, like all scientific discoveries of their day, is now engaging the attention of the medical mind the world over. Medical journals are filled with articles pertaining to its use in diseases of all the special branches of medicine, glowing reports are made, wonderful cures reported, and volumes have been written. Will it produce the gratifying results as vaccination for immunizing against smallpox, or will it meet with the adverse criticism as salvarsan has in the cure of syphilis?

If we are to believe the bacteriologist, therapeutic imperialism, which has been with us since the days of Hippocrates and Galen, fortunately will be a thing of the past and thousands of pharmaceutic preparations will be no more a means of financial gain.

Serum therapy and vaccine therapy would seem to be the logical products for determining the basic principles which underlie the action between the disease-producing agent and involved organism. With this as a working basis a great deal has been accomplished already and the future developments in its use seem promising.

The mucous membrane of the nose and throat, by reason of its functions and location, is the tissue of the body most exposed to the various disease-producting organisms. We are constantly inspiring air laden with bacteria, and the food which we eat often contains numerous colonies of these disease-producing germs. The bacteria which have been found most frequently are the staphylococci, streptococci, pneumococci, micrococcus catarrhalis, bacillus influenzae, bacillus of Friedlander, and various organisms morphologically resembling the diphtheria bacillus.

While a great many of the acute and chronic diseases of the nose and throat have been treated successfully with bacterins by many, yet my experience has been quite limited, and what our results have been is not a fair test of its value in some cases

*Read before the Philadelphia Laryngological Society, May 19, 1914.

and its failure in others. In treating hospital cases it is almost impossible to continue treatments for any definite period of time, or is it possible to note the final results in but a very few, because of the fact that they are often prone to go from one clinic to another.

Case 1: I treated personally in my office a young lady, aged 35, who has had a marked atrophic rhinitis since early childhood and has been treated by various laryngologists, with no permanent improvement. I treated her with a stock catarrhal vaccine; she received two injections weekly, starting with half of a centimeter, and increasing to one centimeter. I could notice a slight improvement in the crust-formation and in the ozena after the third injection. She was given in all twelve doses and it has now been two months since the treatment was discontinued and her condition is the same to-day as when the treatment was started. Nothing was used at this time. in a local measure, except cleansing solutions in the nostrils.

Case 2: A young man, aged 30, had a history of acute rhinitis, coming on at frequent intervals as he stated, when least subjected to a draught. These attacks occurred equally in the summer and winter months. When I first saw him last August I found that he had a marked deflection of the nasal septum and enlarged obstructive tonsils. Both of these conditions were corrected but failed to give him any marked relief. I then tried to immunize him by the use of stock combined catarrhal vaccines. I administered first the vaccines made by a well-known manufacturer, giving him two injections weekly until twelve were given, with no apparent results. A few weeks later I tried vaccines made by another firm; the same number of injections were given, and it is now about three months since his last injection, and up to the present time he has had no acute attacks of rhinitis.

Case 3: Case of doctor who complained of having frequent attacks of colds in the head, in which the vaccines manufactured by a local firm have produced an apparent immunity, lasting one year.

In all, excepting accessory sinus cases, we have treated at the Jefferson Hospital Clinic ten cases. Five were treated by Dr. Lott and five by Dr. Hearn, assistants of the clinic. Seven of these cases were well-marked cases of atrophic rhinitis; out of these cases six were much improved and one slightly so. In two of these the ozena was practically relieved. The final results we are unable to give at this time on account of the cases not returning. There were two cases of chronic naso-pharyn-

gitis; one was very much improved and one practically cured. There was a case of retarded resolution, following rhinitis, which was entirely relieved by one injection.

All of these cases were treated by stock combined vaccines, and the dosage and frequency were followed according to the directions given by the manufacturers. So far there have been no complications, excepting the case of atrophic rhinitis which I had in my office, which developed in the course of treatment an acute laryngitis, but which I did not attribute to the use of vaccines. There were slight local reactions in some of the cases and some followed by a slight chill and rise in temperature.

Personally I feel that there has been less success in the treatment of nasal disorders than there has been in chronic suppurative otitis media and chronic suppurative sinusitis. It has been the experience of some that in order to keep patients suffering with atrophic rhinitis in an improved condition it appeared necessary to continue the treatment indefinitely. So far as I have been able to determine by experience and by the experience of others, we have as yet no satisfactory index to dosage. Most of the writers deem it advisable to begin with small doses, that is doses which have been shown to do no harm as far as we can judge by clinical evidence. The injections are to be given from four to seven days apart, the size of the dose being increased slightly each time, and if there is no evidence of improvement from the treatment larger doses are recommended. If the reaction becomes marked the dose is diminished, and the increased dosage carried out less abruptly and at longer intervals.

As Dr. Simon states in his work on "Infection and immunity:" "There are no hard-and-fast rules to be laid down at the present time. The would-be immunizator must learn from experience and should not pay too much attention to 'negative and positive phases' when these are based on the feelings of well-being and on depression on the part of the patient. He should be neither of too optimistic nor of too pessimistic a temperament and should weigh the evidence with a calm, unbiased mind; in other words he must be an exceptional individual. I really know of no field in medicine at the present day where it is possible to draw so many erroneous conclusions regarding the value of a therapeutic agent as in the domain of vaccine-therapy in its application to chronic infections. Much good can unquestionably be accomplished, but we must be careful not to attribute all improvement to our immunizing efforts."

261 South Seventeenth Street.

VACCINE TREATMENT IN ACCESSORY SINUS SUPPURATION.*

DR. ROSS HALL SKILLERN, Philadelphia.

PREVIOUS EXPERIENCES: Several years ago I used autogenous vaccines on a small number of cases of chronic purulent ethmoiditis and while the immediate results appeared to show improvement the ultimate results were not sufficiently encouraging to warrant continuing their use.

PRESENT EXPERIENCES: Within the past few months we have instituted treatment of sinus suppuration with stock vaccines. The number of cases treated were twenty. Frontal acute 3, chronic 4; ethmoidal chronic 8; maxillary acute 3, chronic 2. Injections varied from two to twelve. The quantity began at ½ ccm. and at fourth injection 1 ccm. No. 36 Sherman was invariably used. Formula: Friedlander bac. 300,000,000, microc. catarrhalis, 200,000,000 streptoc. 60,000,000, pneumon. 80,000,000, staph, aur, and alb, a. a. 200,000,000. In the acute cases two or three injections sufficed while the chronic cases always went to the full number.

RESULTS IMMEDIATE: The results within two days were often so good as to delude one with false hopes. The local reaction where the injection was made was always marked from the first application, appearing as a greater or lesser soreness and stiffness in that portion of the arm or leg. Subsequent injections provoked this reaction less and less. The sinus condition was usually better although in the chronic cases the discharge was often worse and occasionally unaffected. The two or three subsequent injections seemed to bring continual improvement, and while this was real in the acute cases, in the chronic it was oftimes but apparent. Up to the present none of the chronic cases have been absolutely cured although many show great improvement.

END RESULTS: *Frontal sinus,* acute 3, chronic 4, cured 3, benefited 2; not improved 2. *Maxillary sinus,* acute 3, chronic 2, cured 2, benefited (acute) 1, (chronic) 2. *Ethmoid cells,* chronic 8; cured 1, benefited 3, not improved 4. Total cured 6, benefited 8, not improved 6. Percentage of cures in acute, 5 of 6 or 86 per cent. Percentage of cures in chronic, 1 of 14 or 7 per cent. Percentage benefited in chronic 8 of 20 or 40 per cent. Percentage of absolute failures in chronic, 6 of 20, or 30 per cent.

CONCLUSIONS: 1. This therapy is of great value in acute cases which are slow in healing and tend to become chronic. 2. It should be a routine procedure in all chronic conditions which show a tendency to be of the latent type. 3. It should be administered after radical operations. 4. It offers the most hope in old operated cases which have not been entirely cured or have become reinfected.

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*Read before the Philadelphia Laryngological Society, May 19, 1914.

BACTERINS IN THE TREATMENT OF DISEASES OF THE EAR.*

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When Wright, of London, published his now famous work of a few years ago on the opsonic index and vaccine therapy, it was generally thought that the end was almost in sight for which medical research had been working since time immemorial, namely a safe, sure and scientific cure for all diseases of bacterial origin. How this has failed of entire fulfillment we all know, but we are daily finding that most of our earlier disappointments were from misunderstandings of the workings of the agents we were using and from the fact that this form of therapy is not suited to all cases. Experience, furthermore, showed that the opsonic index which seemed destined to be a reliable guide to the dosage to be employed, failed because of its difficult technic and the consequent great variation in readings. To compensate for this loss, observers soon found that a close study of the clinical signs and symptoms following injections of bacterins was a more reliable guide and at the same time one open to the general practitioner and to those untrained in the more intricate laboratory methods. In the general application of bacterin therapy to all known diseases that followed the announcement of Wright's work, diseases of the ear were of course included, but the work done, in this country at least judged from the published reports, was sporadic.

Levy.[1] in 1909, reported a series of cases collected by him as follows: Acute purulent otitis media, cured 19; improved, 1; not improved, 4; total, 24. Chronic purulent otitis media, cured, 13; improved, 6; not improved, 5; total, 24. He does not state whether autogenous or stock vaccines were used nor mention the infecting organisms. Nevertheless, the proportion of cures is large and well worthy of serious consideration.

As an indication of the use of vaccines in serious complications of otitic disease a report by Graef and Wynkoop,[2] in 1910, of a case of lateral sinus thrombosis cured by this means is of interest. The case was one of ordinary acute suppurative otitis media followed by mastoiditis and operation and later on by

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the development of sinus thrombosis and bacteriemia. Injections of a stock suspension of streptococcus followed by the autogenous vaccine as soon as it could be obtained, effected a cure. In all, the case received twenty-three doses of vaccine aggregating 413 million organisms.

Dwyer,[3] in 1910, in a general report on vaccines, mentions a number of ear cases treated with autogenous preparations. In his cases of subacute suppurative otitis media he used suspensions of staphylococcus, streptococcus or bacillus pyocyaneus. Of those treated with staphylococcus vaccine 3 were cured, 1 improved and 1 not improved; with the streptococcus, 4 cured, 1 not improved; with the pyocyaneus bacillus, 7 not improved. In the case of the latter organism he says that this result was not unexpected "on account of the well-known cultural and pathogenic characteristics of this bacillus, it being one of low pathogenic power, at least for man, generally existing as a parasite, not being the primary invading organism but a secondary one." Thomas[4] says practically the same thing in regard to this bacillus. Dwyer further reports four cases of chronic suppurative otitis media of which 3 were cured and 1 not improved, and states that most of his ear cases were chosen from the subacute type because of the desire to obtain quick results, they being out-patient dispensary cases who could not be kept under observation for a long period of time; but that it is reasonable to suppose that chronic suppurations of the ear would yield as surely if not as quickly. Even where a necrosis of the bone is present, by stimulating the resistance of the body to the causative organism, the dead bone should gradually loosen and come away and a cure eventually result. Later experiences of other observers would seem to bear this out.

Still,[5] in 1911, reports 124 cases of middle-ear infection in infants and young children treated by vaccines with the following results: 70 cured, 22 improved, 24 lost track of, 5 not improved, 3 mastoid operations. Many of these were chronic suppurations of years' standing. It is interesting to note the causative organisms obtained and used in the preparation of the vaccine: Staphylococcus albus, 39; staphylococcus citreus, 12; staphylococcus aureus, 19; streptococcus, 26; streptococcus and staphylococcus, 12; diphtheria, 14; pneumococcus, 4.

Thirty cases of middle-ear disease treated by autogenous vaccines were reported in 1911 by MacDonald[6]. Thirteen of these were subacute cases, 12 caused by staphylococcus albus and 1

by pneumococcus. All healed promptly. In the chronic class there were 17 varying in duration from three months to thirty years. He reports 3 cured, 5 improved and 9 with no improvement. One of the cured cases showed a mixed infection of staphylococcus albus and bacillus pyocyaneus. He does not recommend vaccines as a routine measure in chronic cases but thinks they should be tried when other measures fail.

Huvelle[7] in an article on the present status of vaccines in the treatment of middle-ear disease in 1912, thinks they are very valuable as an aid to treatment, and that in most cases they will succeed in checking the discharge, and moreover, that they very much shorten the time of convalescence in the subacute cases and hasten the healing of wounds caused by the operation for mastoiditis.

In 1912 also I find a report on the subject by Christie[8] who advises the use of vaccines only in those cases which have resisted local treatment and then in addition to and not in exclusion of, such treatment. He believes vaccines have a great deal of usefulness in acute and subacute cases but that in the chronic variety their value is much restricted.

Sherman[9] considers that many cases of aural vertigo are due to changes in the middle ear and labyrinth caused by a micro-organismal infection, even including the so-called sclerotic cases in this category. And he furthermore believes that in the great majority of instances the streptococcus is the primary invading organism, although it is often contaminated or even replaced by the staphylococcus. Acting on this theory he has treated cases of aural vertigo with injections of streptococcus vaccines (presumably stock), and reports a series of twenty cases successfully treated in this manner.

West,[10] of London, has used vaccines very successfully in furunculosis of the auricle and external canal, as have many other practitioners. He says that these cases of furunculosis are almost invariably due to the staphylococcus aureus, and that striking results are sometimes obtained with this vaccine in chronic eczema of the auricle. In acute suppurative conditions of the middle ear, he thinks vaccines never do harm if given with due caution and often excellent results are obtained. In lateral sinus thrombosis it is his custom to give streptococcic vaccine as the patient leaves the table after operation and claims that his mortality has been greatly reduced in this way. In contra-dis-

tinction to the observations of most of the other authors quoted, West has seen "immediate and remarkable success reward vaccine administration in cases of pyocyaneus infection."

Of great interest is the report of Weston and Kolmer[11] in the treatment of acute suppurative otitis media (scarlatinal) by bacterins. Their experiments were conducted in the Philadelphia Hospital for Contagious Diseases in 1910-11 and cover 100 cases in all but one of which autogenous vaccines were used. The organisms most frequently found by them in this class of cases were the psuedo-diphtheria bacillus, staphylococcus aureus and bacillus pyocyaneus in the order named. In all but fifteen cases dry ears were obtained in a much less average time than had been the case when other methods of treatment had been used. Under vaccine treatment 22.9 per cent of the cases were cured in from one to thirty days as compared to only 7.46 per cent by other methods. They conclude that the best time for beginning treatment of these cases is from the eighth to the sixteenth day of the discharge. The one case on whom a stock vaccine was used had resisted a pyocyaneous autogenous vaccine but yielded to a stock preparation of staphylococcus aureus and bacillus psuedo-diphtheria after the fourth dose and in spite of the fact that his ear had been suppurating for ten years. The technic employed by Weston and Kolmer was in most respects similar to that employed by Nagle and others which I shall describe in detail later on, except that, where there was a mixed infection, each organism was plated out and grown separately and then mixed afterwards, which allowed greater accuracy in dosage.

By far the most important work to us as aurists, in my estimation, is that done by Dr. Evelyn Wyman Nagle, of Boston. At the meeting of the American Laryngological, Rhinological and Otological Society in Washington in 1910,[12] she read a report of forty cases of chronic suppurative otitis media treated by autogenous vaccines with but one failure to secure dry ears. Two of these cases relapsed after intervals of one or two years. In the first case the child had removed from Boston so that a further trial of vaccines could not be made, but in the second this treatment was reinstituted with twenty injections and the ear was still dry after eleven months. Such a report as this was startling and was received by the profession with some skepticism. It was, however, the result of intelligent, careful and painstaking technic such as must always be employed in this

form of therapy to obtain the best uniform results. I shall quote her own description of the preparation of the vaccine since it is the method employed by most skillful bacteriologists:

"In making my vaccines I took the pus which was forced out into the aural canal from the Eustachian tube by catheterizing. The canal was previously cleansed with alcohol and dried. This discharge was smeared over the surface of the culture tubes and these tubes were then incubated at a temperature of 37° C. until the growth had nearly reached its height.

"The time of incubation varies according to the rapidity of the growth of bacteria. When the height of the growth is nearly reached it is washed down into the bottom of the tube, off the surface of the media, with normal saline solution under sterile conditions and collected in one tube. The tube is then sealed with the blow pipe and subjected to the lowest temperature for the shortest period that is possible to kill the organisms. The vaccine was then tested to see if it was sterile, and, if not, the tube was then sealed again and subjected to more heat. In staphylococcus vaccine six hundred million bacteria were put into every cubic centimeter of the vaccine, while vaccine made from other organisms contained only one hundred million bacteria to the centimeter. I put the vaccine in sterile bottles holding fifty cubic centimeters and sealed it with an inverted rubber nipple. The well thus made by inverting the nipple was filled with absolute alcohol to sterilize it before pushing the aseptic hypodermic needle through it to draw out the vaccine.

"It is quite essential to have an active vaccine. The activity depends on getting a virulent type of bacteria, on killing them at the right time, before they begin to lose their characteristics, and on subjecting them to the lowest degree of heat for the shortest time necessary to kill the bacteria."

The initial dose was small, one quarter of a cubic centimeter or a hundred and fifty million in the case of staphylococcic vaccine, increasing it to one-half, two-thirds and so forth at three-day intervals. Clinical observations replaced the taking of the opsonic index and were found satisfactory in judging the dose. There were no ill effects, a slight headache, malaise, depression, and once or twice nausea being the only symptom complained of. A sense of exhilaration comes on about twelve hours after this depression, lasts from two to two and a half days and is again followed by depression. The next dose is timed to be given as the exhilaration is beginning to wear off. The general physical condition of these patients improved under tratment and the vaccine was given about six times after the ear became dry to insure against relapses. It is to be remembered that all of these cases were of the chronic variety, had all had, and resisted, the ordinary forms of treatment, and in thirty-six of them the

discharge had continued from one to forty years. Dr. Nagle also observed that often treatment with a staphylococcic vaccine alone would so raise the resisting power of the blood that the other bacteria present were killed at the same time as the staphylococci.

Nagle,[13] at the Ninth International Otological Congress in 1912, reported a further series of thirty cases. Only twenty-five of these should be counted, as the other five did not report regularly for treatment. Of these twenty-five, twenty-two were cured at the time of writing and three were still under treatment greatly improved. This makes a grand total of sixty-five cases with but one failure, a truly remarkable record and one that should stimulate us all to do more of this work. Three essentials in this form of treatment are promulgated: the vaccine must be active, the period of time between doses so regulated that the power of resistance shall be raised each time and correct dosage used, but no rules can be laid down for these.

McKernon[14] has noticed that in all cases of mastoiditis following scarlet fever operated upon, healing is complicated by soft, flabby granulations with an excess of discharge, greater than that found in ordinary infection of the mastoid, and furthermore that the sutures sloughed, the healing was always protracted, and difficult, and that ugly scars usually resulted. He finds this to be true, in a lesser degree, in those cases of mastoiditis following measles. Since using autogenous vaccines prepared from the pus found in the mastoid cells in ten cases at the time of his report in 1910, all of his cases have healed rapidly and nicely, and compare most favorably in this respect with the average simple mastoid wound of other infections. He also found that in these cases there was a rapid disappearance of the ear discharge and restoration to normal of the middle ear and drum membrane. These scarlet fever cases showed the streptococcus. His average dosage was twelve millions for a child 2½ years old, for the initial dose, and increased every other day by six millions to a maximum of thirty millions. In older children with high temperature he started with fifty millions and diminished the dose as the temperature dropped. These results are in accord with those of Weston and Kolmer, quoted above.

The experience of the writer began about three years ago with the use of autogenous vaccines in acute and subacute

cases and has extended to cover the chronic form of ear suppurations as well and also includes a rather large series treated with commercial mixed bacterins. To properly consider this subject, it is necessary to divide our cases into acute (including those ordinarily spoken of as subacute) and chronic, and to further divide these two classes into those treated by autogenous (or in some instances by laboratory stock) vaccines and those in which the commercial product was used.

I prefer to consider first the acute (and subacute) cases treated with autogenous or laboratory stock vaccines, as I have but a few cases to report and the history of one is the history of all. There were but five of these cases each starting as a severe acute suppurative otitis media; incision of the membrana tympani; copious discharge but without entire relief from pain or return of the temperature to normal. Moreover, there was in each case a well-marked mastoid tenderness, with some redness and puffiness back of the auricle, and a leucocytosis. This condition remained stationary for a week or ten days, when vaccine treatment was instituted. In two of these cases a laboratory stock vaccine was used (staphylococcic) and both cases cleared up after the second dose of two hundred million and proceeded to prompt convalescence.

In the other three where the trouble had continued for two or more weeks an autogenous staphylococcic vaccine was administered. Two cleared up at once; the other who received 900 million at a dose soon lost her mastoid symtoms but the ear was not permanently dry for three weeks.

It must be borne in mind that in treating these acute cases too much credit for the cure may be given the vaccine. Many of the cases heal either spontaneously or with ordinary drainage and cleanliness, so that it is often impossible to say positively that the cure was the result of the treatment, especially in such a short series of cases as here presented. Nevertheless, it is the opinion of the writer that this was the determining factor in each case, as the disappearance of the persistent mastoid symptoms was prompt and permanent. One of these cases had been urged to have a mastoid operation and had refused, and the bacterin treatment was administered as the only alternative.

In chronic ear suppuration it is much easier to say definitely that a given treatment is efficacious or not, but even here, many cases are of the intermittently discharging type so that unless we can, in spite of discontinuing other forms of treatment, se-

cure prompt cessation of the discharge and can, by observation over a long period of time, assure ourselves that it has not returned, we can only keep the method *sub judici.* The chronic suppurations here reported are few in number. and were not very satisfactory patients because of their tendency to become discouraged, their objection to the hypodermic needle and the severe type of middle-ear disease present. They were cases that had successfully resisted other forms of treatment and had been discharging from one to fifteen years.

Case 1 discontinued treatment after two doses very much improved, but we are unable to trace her to determine the final result. She showed a pure culture of staphylococcus and was given doses of 100 millions at six-day intervals. She was 2½ years old and one ear had discharged for one year.

Case 2: Boy, 9 years old; both ears discharging since infancy. Great destruction of the tympanic membrane. Cultures showed bacillus psuedo-diphtheria and bacillus pyocyaneus. He was given 730 millions at intervals of three and four days at first and showed improvement from the start, being discharged with dry ears in eight weeks.

Case 3: Girl, age 5; discharging ears, very foul since infancy, masses of granulations filling each canal. Culture showed psuedo-diphtheria and staphylococcus and the dosage was 250 millions at four day intervals. Later in the case the staphylococcus was replaced by the bacillus pyocyaneus. She is still, after four months, under treatment, having been rather irregular in attendance, and the ear still suppurates, although very much reduced in amount. The foul odor also persists, but the granulations are almost gone. I believe that, while she is a failure at present, we may yet obtain a dry ear by persistent treatment.

Case 4: Girl, 17 years old, having a discharge from the right ear for fifteen years with destruction of the drum and granulations. The infection proved to be diphtheria bacillus, type D, and she was given 700 millions at intervals of one week. The discharge lessened after the first few injections and the ear was dry in ten weeks.

Case 5: Girl, 7 years old, with profuse discharge from the ear for two years, having resisted all treatment showed staphylococcus and pyocyaneus. The record of the dose in this case is lost but the ear became dry after six injections.

These cases, with one exception, have not been dry for a long enough period to be able to say definitely that they are cured, but the fact that they became dry at all or even improved is a decided gain.

The treatment of any disease by mixed commercial vaccines on the old-fashioned shot-gun principle has been universally condemned by most writers as unscientific and dangerous, and it was with some hesitancy and considerable skepticism that the writer decided to try out this form of treatment in cases of suppurative otitis media. It was done for the following reasons:

The general practitioner or specialist throughout the country and in the smaller towns and cities has not access to a laboratory where he can have the infecting organism determined and have a vaccine prepared, neither has he the time, apparatus or the technical knowledge to do it himself. Furthermore, many patients even in the larger cities cannot afford the expense of these examinations and yet are not of the class willing to go to the dispensaries as charity patients. While without doubt the use of an autogenous vaccine, properly made, is the only true scientific way of treating these cases from the standpoint of vaccine therapy, it occurred to the writer that if it could be determined that the mixed commercial bacterins, used empirically, had value, it would be a great boon to many a practitioner of medicine and many a poor but worthy patient, since the cost of this form of therapeutics is little and the administration easily performed.

The conditions under which this trial was carried out were therefore made precisely similar to those of cases treated in the heart of the country districts and were made as rigid as possible. In other words *no* other treatment was given, the causative organism was not ascertained by culture and the dosage was made dependent on clinical observation. The Social Service Department was of great use to us in bringing back for observation and treatment, cases who became negligent about regular attendance, and its workers are most enthusiastic about this method. The cases were taken just as they presented themselves, acute, subacute or chronic, and many of them were those who had run the gamut of methods of treatment, other than vaccines, without result. I shall not give the detailed histories at this time as this is merely a preliminary report on this phase of the subject, and a summary of the results obtained is enough for a paper of this description.

Two formulas were used chiefly, as follows: The first contained Friedlander's bacillus, 300 millions; micrococcus catarrhalis, 200 millions; pneumococcus, 80 millions; streptococcus, 60 millions; staphylococcus albus, 200 millions; staphylococcus aureus, 200 millions, per cubic centimeter. The second formula was: Streptococcus, 100 millions; pneumococcus, 100 millions; staphylococcus albus, aureus and citrius, each 200 millions; and colon bacillus, 200 millions.

The technic was simple: The arm was scrubbed with alcohol and the injection given just beneath the skin and above the elbow. This was repeated at forty-eight-hour intervals in the acute cases, and at three or four day intervals in the chronic ones, alternating from one arm to the other. If results were not obtained after a few injections with one formula the other one was tried, and sometimes the two formulas were used alternately. The only reactions observed were the hyperemias surrounding the site of the injections for the first two or three doses, usually fading out in twenty-four to forty-eight hours. Eleven cases showed no hyperemia at all, and in three it was intense and accompanied by considerable induration, which, however, subsided in one or two days without any further treatment than another injection of the same vaccine at the same place on the same arm.

In the acute cases the best results were obtained by giving slightly larger doses at shorter intervals, namely forty-eight hours. The average initial dose for all types was 0.2 ccm. for children under 3 years of age, 0.3 to 0.4 ccm. for those from 3 to 6 years, and 0.5 ccm. for all over that. This dose was doubled at the second and third injections and, when the ear became dry, two injections of the maximum dose were given at three-day intervals to ensure permanency. In small under-developed children the dose was made smaller than that I have just mentioned, and the maximum dose for adults was about 1.5 ccm. In the favorable cases an increase of discharge was noted after the first and sometimes after the second injection, but the discharge became more serous in character. In the majority of cases the external canal was only damp after the third or fourth injection and dry at the fifth.

Sixty-three cases were treated altogether and of these fifty-six were apparently cured, although several of them became dry, relapsed, usually through non-attendance, and then, on resump-

tion of the treatment, again became dry. Two cases were improved only, and five were unsatisfactory. These five cases were all of a severe type with fetid discharge and granulations. These were cultured out to determine the cause of the failure and gave the following results:

One showed diphtheria bacillus and pneumococcus, one tubercle baccilli and pneumococcus, and two pneumococcus and bacillus pyocyaneus. They are now under treatment with autogenous vaccines.

While none of these cases has been dry for a long enough period of time—six months being the maximum—to say that they are permanently cured, yet the results obtained are sufficiently striking to warrant further trial of this easy method, particularly as no bad results have been observed. It has also been used in a number of acute cases in private practice with uniformly good results although these are not included in the above series. In the series of dispensary cases, seventeen were acute or subacute (several with mastoid tenderness) and forty-six were chronics extending over periods varying from six months to many years' duration.

The writer desires to express his appreciation of the help given him by his assistants, Dr. William Nichols at the Polyclinic and Dr. Leslie F. Mulford at the Pennsylvania Hospital, who did much of the actual work under his direction, and to the enthusiastic co-operation of the Social Service Department of the latter hospital and the attendants at the Children's Bureau. The majority of these cases were returned for final observation a short time since by these agencies and the results verified. They reported that those whom they were unable to induce to return excused themselves by saying that they were well, that their ears were dry and that they could not afford to take the time from work or school to come to the dispensary.

After careful consideration of the work of others and from his own limited experience in the bacterin therapy of aural disease, the writer has reached the following conclusions as to the value of this method which he now offers for your judgment: In view of the results quoted above, it can scarcely be doubted that this form of therapeutics is destined to play an important part in the practice of otology. Theoretically autogenous vaccines should prove the most useful since they are the most scientific, and where obtainable should be used, but it takes a skillful bacteriologist to make a potent vaccine, and if it is not potent,

failure will result. Many hospitals and other laboratories keep on hand stock suspensions of the more common varieties of bacteria for use in emergencies where time will not permit the making of an autogenous vaccine, which often takes four or five days, and these stock vaccines may be of much value where the invading organism can be determined. In many cases, however, it is expedient to use a mixed commercial vaccine without such determination and it has, I think, been shown that good results can be obtained by this means. But this vaccine must also be potent, which means that the firm producing it must be a reliable one, employing very skillful bacteriologists. Either of these methods seems to give nearly perfect results in acute and subacute cases, and that either may give the same results in chronic cases seems to be shown by the two series of cases (Dr. Nagle's and the writer's) reported above.

BIBLIOGRAPHY.

1. ROBERT LEVY: Vaccine therapy in otology, rhinology and laryngology. *Ann. of Otol.*, March, 1909.

2. GRAEF AND WYNKOOP: Vaccine therapy in serious infections of aural and nasal origin. *N. Y. Med. Jour.*, July 9, 1910.

3. J. G. DWYER: Use of vaccines, serums and the Hiss extract of leucocytes in the treatment of eye, ear, nose and throat infections, with report of cases. *Ann. of Otol.*, June, 1910.

4. B. A. THOMAS: Results of three years' experience in bacterial immunization. *Jour. A. M. A.*, Jan. 29, 1910.

5. E. M. STILL: Bacterial vaccines in middle-ear infections in infants and young children. *N. Y. State Jour. of Med.*, April, 1911.

6. C. L. MCDONALD: Results in the treatment of thirty cases of otitis media by vaccine therapy. *Jour. A. M. A.*, June 3, 1911.

7. R. H. HUVELLE: Present status of vaccine (bacterins) therapeutics in purulent diseases of the ear. *N. Y. State Jour. of Med.*, May, 1912.

8. A. C. CHRISTIE: Vaccines in suppurative otitis media. *Med. Record*, Sept. 28, 1912.

9. G. H. SHERMAN: Bacterins in the treatment of aural vertigo. *Am. Med.*, August, 1912.

10. C. E. WEST: Vaccines in Aural Practice. *Clin. Jour.*, Oct. 25, 1911.

11. P. G. WESTON AND J. A. KOLMER: Treatment of suppurative otitis media (scarlatinal) by bacterial vaccines (bacterins). *Jour. A. M. A.*, April 15, 1911.

12. E. W. NAGLE: Results of vaccine therapy in chronic suppurating ears. Trans. Am. Laryngol., Rhinol. and Otol. Soc., 1910.

13. E. W. NAGLE: The vaccine treatment of suppurative otitis media. Trans. Ninth Internat. Otol. Congress, 1912.

14. J. F. MCKERNON: The value of vaccine therapy in mastoiditis complicating acute infectious diseases. Trans. Am. Laryngol., Rhinol. and Otol. Soc., 1910.

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THE DEAF

Their Education—Improvement of Conditions—Responsibilities and Participation of the Profession.

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The aim of this department of THE LARYNGOSCOPE will be to bring to the notice of its readers from month to month, facts that may be helpful to physician and patient in dealing with the life-problems involved in deafness. Suggestions from readers will be gladly received and all questions answered to the best of our ability.

THE EDUCATIONAL NEEDS OF THE DEAF.

(Continued from the May, 1914, issue, page 546.)

A concise summary of information for the guidance of physicians, in procuring for their deaf patients the requisite educational treatment supplementary to medical and surgical relief.

Class 1. Group B. Children and young people of school age: Very few of the public schools for the deaf will accept pupils as young as 5 years of age. Yet that is the proper time for an otherwise normal deaf child to begin regular school instruction in speech and language. Previous to 4½ or 5 years of age the child has not sufficient mental grasp and maturity to benefit to an adequate degree from the skilled instruction of the trained and experienced teacher. Up to that time the parents, under the guidance and advice, perhaps, of a teacher, can do what is necessary for the child.

Group B may be divided into five classes: 1. Those with hearing slightly impaired from infancy. By 5 years of age even very slight deafness will have produced marked results. If speech has been acquired, it will be more or less imperfect, especially in those sounds whose formation is less evident to the eye and whose sound is less clear and penetrating; for example, the Ks and Gs, and the accurate distinction between the more similar vowel sounds. The child's vocabulary will be small and its mental development behind its years. The greater the degree of deafness, and the earlier it occurred, the more marked will be these characteristics. Of course, the physician's examination will previously have excluded other

causes of defective speech, such as cleft palate, tongue tie, partial pharyngeal paralysis, extraordinary adenoid growths, etc.

When the child is otherwise normal, mentally and physically, and but slightly deaf, the permanent correction of its speech and the normal increase in its vocabulary is not a difficult matter for the trained and experienced teacher. But unless such special attention is given early, the unfortunate effects of slight deafness are cumulative.

Even while the physician is using all remedial devices for the hearing, the speech-teacher's aid should be invoked.

2. Those with hearing seriously impaired from infancy: In these cases the effects upon speech, vocabulary and mental development will be still more marked. Very little, if any speech will have been acquired, and that will be very imperfect.

Even if the deafness seems likely to yield to remedial treatment some time would naturally be required, and the removal of the unfortunate results of the previous lack of hearing will in itself require the assistance of a trained teacher. Therefore, the physician should urge the parents to secure the co-operation and help of some person experienced in teaching the deaf by the speech method, even while he is conducting his own measures for removing the cause. The more promptly this assistance can be rendered the more rapid and satisfactory will the results be.

If the hearing cannot be restored or improved, then the trained teacher of speech is the child's only hope of acquiring the ordinary means of communication, and such education should be arranged for at once.

The physician should, however, impress upon both parents and teacher the very great desirability of educating and developing the residual hearing-power possessed by the child, no matter how slight it may be. This auricular development is often neglected and a valuable aid to speech and mental development thereby lost.

3. Those totally deaf from infancy: These children will never learn to speak or understand when spoken to unless they receive special instruction. The ear is the natural teacher of speech. Without it speech is never acquired except by patient and skilled teaching. Such teaching can only be successfully accomplished by those who have had much training and experience in this work.

The situation of a deaf child differs very much, from an educational standpoint, from that of the little hearing child. Two hours a day playing educational games in a kindergarten is as much as is usually given or is needful for the little hearing child up to 6 or 7 years of age; and his mental development and success in after life

will not be seriously endangered if even that is omitted and he does not begin to go to school until he is 8 or 9. The hearing child of 8 who has never been in school and cannot read or write, has, nevertheless, without conscious effort, mastered the two most important educational tasks in life. He has learned to speak and has acquired the greater part of his working vocabulary. In other words, although he has never been across the threshold of a school, his education is well advanced for his years and mental development.

The situation of the uninstructed deaf child of 8 is very different. The task which it has taken the hearing child 8 years to accomplish, the deaf child of 8 has not even begun. He cannot speak a word; he does not even know that there is such a thing as a word. He is eight years behind his hearing brother, and even if he starts now, unless some means can be found for aiding him to overtake his brother educationally, he will be only eight years old in education when he is 16 years of age. And when he is 16, the psychological period will have passed for acquiring what he should have learned when he was 8. The fact that the child is deaf does not exempt him from the inexorable laws of mental psychology and heredity. In the development of the human mind there is a certain period when all conditions are favorable for the acquisition of speech and language. Unnumbered generations of ancestors acquired speech and language at that stage of their mental development, and this little deaf descendant's mind obeys the law of inherited tendencies.

If the speech and language-learning period, from 2 years of age to 10, is allowed to pass unimproved, the task of learning them later is rendered unnecessarily difficult. Every physician can appreciate the force of these facts.

Therefore, in the case of the little deaf child, the years from 2 to 10 are crucial, and of far greater educational importance than the same period in the case of the hearing child.

If a proper school for the little hearing child of 5 did not happen to exist in his immediate neighborhood, no one would think of insisting upon the necessity of sending the little one away to a distant boarding school. But that is what must be done in the case of the little deaf child, if precious and irrecoverable years are not to be lost. It is often a difficult matter to persuade a mother to sacrifice her own personal happiness and comfort in having the little child with her, and to look far enough into the future to see that a true and unselfish love for the child requires her to entrust him to the care of others during these early and crucial years. This is one

of the tasks that the physician should set himself in the cases that come under this third group of Class 1.

Because of the extreme importance of these beginning years in the life of the little deaf child, it is a serious responsibility to assume the task of teaching him. Unfortunately, it is a responsibility that is rather lightly assumed by some young women inadequately trained and without much experience. The highest skill and widest experience on the part of the teacher are more necessary during the first three years of the child's educational life than at any other period. Yet mothers will often entrust their little children at this crucial time to inefficient young women who are willing to come to their homes, rather than to part with the child and place him under more skilled and experienced teachers in a well organized school.

The teaching which the little deaf child receives during the first three years of his educational life is of vital importance to him. He needs then, as he will never need again, the highest skill and the greatest experience. Many a child's chances have been ruined by poor teachers at the start.

4. Those rendered partially deaf by accident or illness after speech has been acquired: The condition of these cases when the physician sees them will depend, so far as speech and education are concerned, upon the length of time that has elapsed since hearing was impaired.

If there has been a considerable interval, then in all probability some deterioration in speech will be observed and there will be a falling behind in school work. If the physician has been consulted promptly and if his advice is carefully followed, the patient's speech can be kept uninjured, the brain can be trained to supplement the ear by means of the eye, and education can be continued without interruption. The success with which the effects of adventitious deafness upon speech and mental development can be overcome depends upon the promptness with which the work of the trained teacher is begun. Even while the patient is still under the care and treatment of the physician it would be well to call in some experienced teacher, though it be for only a few minutes a day, in order that there may be no opportunity for laxity of enunciation to creep in, and that there may be no interval of interruption in studies. In this way the transition from the old to the new condition is made almost unconsciously, and with the least possible loss and annoyance.

5. Those rendered totally deaf by illness or accident after speech has been acquired: All that has been said under the fourth head-

ing holds true with additional force where total deafness has occurred. The deterioration in speech that will inevitably follow, the interruption in school life that must occur, are both more swift and more severe where the patient no longer hears at all. It is often astonishing how immediately a loss in clearness of pronunciation occurs following the loss of hearing by such causes as scarlet fever, meningitis, mumps, etc. The younger the child the more rapidly deterioration takes place, but even young people of 16 or 20 soon suffer some loss in normality of speech. So far as school work is concerned the interruption is immediate and complete, for without hearing the pupil finds it impossible to meet the conditions of the ordinary school.

The alert and thoughtful physician knows this and will at once advise his patient to take prompt measures to forestall loss of clear enunciation, and to make the transfer from the ear to understanding by means of the eye. In the case of young people this transition can be made in a few months, and with but little interruption in education.

Two Cases of Suppurating Meningitis of Otic Origin. Followed by Cure. G. COULET, *Rev. hebd. de Laryngol.*, May 2, 1914.

The first case reported is one of chronic suppurating otitis media accompanied by osteitis of the antral wall and tympanum with erosion of the labyrinth and infection of the perilymphatic space. The radical operation liberated the pus and ended the infection of the labyrinth, while the repeated puncture of the lumbar cul-de-sac eliminated the bacteria colonizing in the cephalo-rachidian space. The second was a case of suppurating meningitis consecutive to an acute otitis media followed in a month by a severe relapse, which was finally cured by three lumbar punctures in two of which an injection of electrargol was made. These two cases show the possibility of a complete cure in suppurating mastoiditis. They demonstrate, moreover, that lumbar puncture forms not only a useful means of aiding the diagnosis, but also that it has distinct therapeutic value. SCHEPPEGRELL.

SOCIETY PROCEEDINGS.

NEW YORK ACADEMY OF MEDICINE.

SECTION ON LARYNGOLOGY AND RHINOLOGY.

Regular Meeting, April 22, 1914.

DR. J. HENRY GUENTZER, Chairman.

Retro-esophageal Abscess Due to Infection from a Foreign Body. DR. ERNST DANZIGER.

The patient was a middle-aged woman who had swallowed a chicken bone which seemed to stick in the esophagus at the depth of the fourth rib. The family physician promptly introduced a stomach tube to press it down; this procedure seemed to relieve her. The sticking sensation was renewed the next day and she sought the help of a laryngologist who examined the larynx, epi-pharynx, pharynx and hypo-pharynx without finding anything. He saw her during the next two weeks, and finally incised the left arytenoid which seemed edematous. At that stage she became feverish and could not swallow even a drop of water which she said would not pass that painful spot in her gullet. She was brought to me in that condition. Under cocain anesthesia an esophagoscope was introduced; there were normal conditions for about seven inches beyond the teeth and then the esophagoscope was arrested by a swelling of the mucous membrane which seemed to come more from the posterior wall. During a gentle attempt to pass the swelling the tube became entirely filled up with pus of such fetid character that the nurse was almost overcome. Quite a large amount of pus was evacuated after the tube was withdrawn. Later another attempt was made to pass the tube, and this time it was passed almost to the cardia. On withdrawing the instrument slowly the pus could be seen escaping from an opening in the posterior wall of the esophagus. The woman was sent to the hospital with a grave prognosis. When seen the next morning she was again not able to swallow, and another quantity of pus was evacuated as on the previous day. Twelve hours after the second evacuation an x-ray was taken, which showed a large shadow originating from the esophagus at about the fourth rib and reaching up almost to the pharynx. As the pus had been drained, the shadow may have represented a mass of infiltration. After the second procedure the patient's temperature became normal within a week and she was able to swallow soft food. She has made an absolute recovery.

The abscess, fortunately, must have been walled off from the mediastinum, and probably was a large abscess due to broken-down glands.

DISCUSSION.

DR. CARTER said that the case resembled one of which Dr. Lynah had shown a specimen some three or four months ago. The patient had an abscess of the esophagus which had not been recognized. He had been

suffering from edema of the larynx and had been intubated by an ambulance surgeon. Dr. Lynah took out the tube for examination, whereupon the patient began to suffer from dyspnea. He then did a tracheotomy, which also opened up the abscess cavity and the patient was promptly suffocated by pus from the abscess. Dr. Carter said that in discussing the case he had suggested that the abscess was due to a foreign body which had perforated from the esophagus and had caused the abscess. He thought then and still thinks that he discovered the point of entrance where it penetrated the esophagus wall. These instances should be borne in mind in dealing with cases of foreign bodies lodged in the esophagus.

DR. WHITE said that on the same evening to which Dr. Carter referred he had presented a patient with a similar condition as the one now being discussed. In his patient the abscess followed the lodgment of a piece of bone in the throat. The abscess although opened repeatedly did not drain well and finally an external esophagotomy was performed followed by healing. When presented, a left-sided paralysis of the vocal cord was present, which since that time has disappeared. Two other cases of abscess of the throat had been treated by him within a short time during Dr. Harmon Smith's service at the Manhattan Eye, Ear and Throat Hospital. These however did not follow foreign bodies but fulminant tonsillitis. Ordinary incisions were of no avail as the phlegmons descended from the tonsils, threatening occlusion of the larynx. In each patient deep incision external to the angle at the base of the epiglottis and base of the tongue of the affected side was followed by free discharge of pus and fairly rapid recovery.

DR. THURBER said in this case the time-element was an important factor. It was perhaps fortunate that the doctor did not see the case until the abscess wall was ready to break through and thus afford easy drainage upon rupture by pressure with the instrument. However, he would not be understood as advocating waiting in all cases until some exploratory incision were made. These cases all demanded very close watching.

A Case of Recurrent Naso-pharyngeal Fibroma. DR. HUBERT ARROWSMITH.

(Dr. Arrowsmith being prevented from attending the meeting, asked Dr. Freudenthal, who had been with Dr. Arrowsmith when the patient was operated upon to present the case.)

Ernesto Fiasco, age, 20 years; single; occupation, rag man; Italian. In May, 1913, the patient noticed that breathing through the left side of his nose was becoming difficult. This difficulty gradually became worse and in six months the left side of his nose was completely stopped up. He entered the hospital November 17, 1913, when the growth was removed from the naso-pharynx, a preliminary tracheotomy being performed. Oil-ether colonic anesthesia was successfully employed.

After one month of comparatively free nasal breathing, the left side presented the same trouble as before and at the end of two months both sides of his nose were so completely occluded that he was compelled to breathe through his mouth. He has experienced occasional dull pains in his nose and left side of his face and head. His weight, appetite and strength were not disturbed prior to the second operation.

Family history, negative. Personal history: Has always been in good health previous to the present trouble. Does not smoke; drinks moderately; Wassermann, negative.

The second operation was performed on March 24, 1914. Tracheotomy and ligation of the external carotid artery were done first. Then an incision was made extending from the glabella along the base of the nose on the left side and through the left ala at its attachment. Another incision was made at right angles to the first, beginning at the mid-point of the initial incision and extending outwards for a distance of 2.5 cm. The soft tissues were dissected from the bone *en masse* and the nasal flap was turned upwards. The left nasal bone and the nasal process of the superior maxilla were resected in order to obtain freer access to the tumor. Masses of a grayish-white, rather tough tissue, were extracted by means of forceps. Bleeding was profuse notwithstanding the preliminary ligation of the external carotid. The hemorrhage was controlled by means of gauze packing. Gwathmey's oil-ether method of rectal anesthesia was used again with entire satisfaction.

Pathologist's report: November 17, 1913, pure fibroma dura. March 24, 1914, same as November 17, 1913, only fibers were more loosely arranged. DR. F. HULST.

DISCUSSION.

DR. FREUDENTHAL: The bleeding was very great but if was checked. The case was operated upon under the Gwathmey oil-ether rectal anesthesia which worked remarkably well. The patient had a few whiffs of ether before he got fully under the anesthetic, but after that slept quietly throughout the operation. I feel quite enthusiastic about this method of etherization for laryngological work. I have seen it employed a number of times and the results are very satisfactory indeed.

DR. COCKS said that the results of the operation seemed to him very satisfactory. He believes that intra-tracheal insufflation is the ideal anesthetic for cases of fibroma of the naso-pharynx. This method has two advantages: (1) It allows the larynx to be packed off with gauze, thus preventing blood from running down into the trachea; (2) it does away with the necessity of performing tracheotomy, an operation always attended with danger to the patient.

DR. GUENTZER said that in looking at this case it struck him that Dr. Kuhnt's method of peroral intubation for anesthetic purposes would be practical in these conditions. Among a number of cases in which this intra-tracheal anesthesia was used, Kuhnt reported quite a few of nasal fibroma. The procedure for operation was not external, but he split the soft palate across from the last molar down on either side, and claimed that he could get as much space that way as by the external operation. He himself had had no experience with the operation but it had impressed him as a very good method and one that possessed the advantage of not leaving a scar.

DR. FREUDENTHAL said that he also had read about Moure's operation, and the idea impressed him as a very good one. He has now under observation a case which is being treated with radium, and he may have to do this operation after all.

In regard to the method of anesthesia mentioned by Dr. Cocks he would only say that we need all the space we can get in the mouth, and for that reason we should not be afraid to do a tracheotomy, especially as in this instance the tracheotomy had already been performed. Dr. Gwathmey's method of anesthesia is very easy to apply. *You simply leave the patient alone.* In this instance the patient was under the influence of the anesthesia for an hour or more.

Successful Removal of Thyroid Gland Weighing 602 Grammes from Girl Thirteen Years of Age. Presentation of Patient and Specimen. DR. W. W. CARTER.

The patient, a girl of 13, came under Dr. Carter's care in the latter part of January. She was suffering from an enormous goiter, the largest he had ever seen in a child of her age. Her personal history was interesting. She had been perfectly healthy up to 10 years of age when her parents noticed a beginning enlargement of her throat, and from that time on the gland grew very rapidly. When first seen she was a little nervous and had a slight ophthalmos. Her grandmother on the father's side had had a goiter, but beyond that the antecedent history had no bearing on the case. The gland reached practically from the chin to the supra-sternal notch, overlapped the sternum and reached up to the mastoid process on either side. The tumor was soft and seemed almost like a fluctuating tumor. It pulsated synchonously with the heart. The superficial veins were very large, and there was every evidence of its being an extremely vascular tumor. The girl's general condition was good, her color was good, she weighed 115 pounds, and seemed healthy. She had no trouble except that when walking fast or going up the stairs she would be short of breath and would cough; the cought was croupy in character. It was easily seen that there was pressure on the trachea. Examination of the chest was negative, excepting that the heart was shown to be hypertrophied; the apex beat was a little beyond the nipple line, and the murmur was evidently a hemic murmur; there was a soft blowing murmur heard with the first sound of the heart. The pulse beat ranged from 120 to 150.

When she first came under observation she was convinced that she would choke to death if the tumor was not removed.

She was operated upon on February 3, an incision being made from the middle of the inner border of the sterno-cleido-mastoid to a corresponding point on the opposite side of the neck. The gland was dissected out and removed in capsule. It was found to be very vascular, some of the veins being as large as a man's little finger. The gland was removed without much hemorrhage, for the vessels were tied off as the operation proceeded. The tumor was in three distinct lobes and weighed 602 grammes when it was removed. The specimen presented has shrunken very much since being placed in the preserving fluid. A piece of the gland the size of a walnut was left in place.

The patient made an uneventful recovery and was out of the hospital in about twelve days. Thorough drainage was obtained by means of large tubes which extended up on either side of the trachea and dis-

charged through the small opening left at the supra-sternal notch. Primary union was obtained throughout.

An x-ray picture shows a considerable enlargement of the heart, but apparently no enlargement of the thymus gland as sometimes happens in these conditions. The pathological report was ordinary multilocular cystic colloid thyroid.

An interesting point in the case was the tachycardia which still persists to a slight degree. It is a question what is causing it. It might be due to a deficiency or over-abundance of thyroid secretion, or it may be due to a change in the chemical constitution of this secretion. It may be caused by the pressure of the tumor on the pneumogastric nerve disturbing its inhibitory influence on the heart, or the pressure on the sympathetic nerve may have acted as a stimulus to its cardiac accelerator fibers.

DISCUSSION.

DR. FREUDENTHAL inquired where the girl was born.

DR. CARTER replied that the girl and her mother were both born in this country.

DR. COCKS asked if the exophthalmos had disappeared.

DR. CARTER replied that it had to a certain extent. It seemed that this might be one of the border-line cases between the ordinary cystic goiter and Graves' disease.

Broncholith Removed from the Trachea and Right Bronchus. DR. SIDNEY YANKAUER.

The patient was a young man, 37 years of age, who came to New York from Texas with the following history: In January, 1910, he had an attack of typhoid fever followed by hoarseness and dyspnea, so that an emergency tracheotomy had to be performed. He was then sent to New Orleans, where a tracheotomy tube was fitted, after an attempt was made, unsuccessfully, to remove the tube permanently. Some time later he went to San Francisco where another unsuccessful attempt was made to remove the tube. The surgeon in New Orleans stated that the wound was made too high up, and that this fact accounted for the difficulty in removing it. The patient continued to wear his tube and was contented until last summer when he developed a growth on the lower lip which was examined by a surgeon in Texas and pronounced to be a carcinoma. This was operated upon in November and half of the lip was removed. The patient recovered from the operation, but about a month or six weeks later he began to cough and suffered from dyspnea and pain in the lower part of the sternum. A radiograph was taken but showed nothing. Then a bronchoscopic examination was made and the bronchoscopist stated that there was a small growth the size of a pea on the posterior wall of the trachea which extended into the bronchus; he diagnosed the case as carcinoma of the lung.

The patient then came to New York with the idea of having Dr. Willy Meyer remove the carcinomatous lung. The patient's father was a physician and brought the young man on with a full knowledge of the danger of the operation. The patient was in such pain and suffering so much that he was confined to bed and was unable to sit up. He had been

taking one-eight grain of heroin hypodermatically every two hours to relieve the pain, and during his journey from Texas to New York had been taking one-fourth of a grain in order to keep him reasonably comfortable. When he reached New York he was admitted to the hospital and preparations were being made for the operation when Dr. Meyer asked me to inspect the trachea and confirm the diagnosis.

An examination was made under local anesthesia and as soon as the lower part of the trachea was reached the presence of a foreign body was immediately recognized. It presented a vertical edge which looked not unlike the spur at the bifurcation of the trachea. There was a mass of granulation tissue posteriorly. Pressure with a probe confirmed the diagnosis of foreign body. This was removed. After the removal of the foreign body the bifurcation was clearly visible, but there was no appearance of carcinoma.

The foreign body had a curved shape, and the two ends were embedded in the mucous membrance, the one in the right bronchus and the other in the trachea. At the point where the ends rested there was a mass of granulation tissue.

After the removal of the foreign body the cough ceased. The patient was able to sit up the next day for the first time in several months and in a week went home.

An interesting feature in this case was the curved form of the foreign body resembling the portion of a tube. Upon examining the tracheotomy wound it was evident that the anterior half of the cricoid cartilage was missing. All that could be seen was a small remnant of the cricoid, posteriorly. Examination of the larynx showed that the left arytenoid was displaced forward and was connected with the posterior surface of the epiglottis. The vocal cord could not be seen. The opening from the tracheotomy wound into the larynx was very small. An examination of the foreign body showed that it had the same appearance and structure as a rhinolith. It looked as though it was the remains of the cricoid cartilage, and it would seem that during the typhoid fever a piece of the cricoid cartilage split off and lodged in the trachea, and during the few years following it changed into lime salts. Then during the operation for the carcinoma of the lip probably some irritation was set up where it was lodged, and in addition to that a shred of gauze was caught on the foreign body, and in swaying back and forth in the air passage it caused the irritation which produced the coughing and bleeding. A body of this kind is exceedingly rare. The number of broncholiths reported in the literature is very small, and the case is one of extreme interest.

DISCUSSION.

DR. GUENTZER asked if it might not be possible that the foreign body formed on the tracheotomy tube.

DR. YANKAUER replied that that was possible, but that the patient was very careful about his tube and kept it very clean, and there was no evidence of concretion around the tube. It was as clean a tube and wound as he had ever seen.

DR. GUENTZER asked if the radiograph showed the position of the foreign body.

DR. YANKAUER replied that the radiograph had been taken in Texas and the surgeon there stated that it showed nothing.

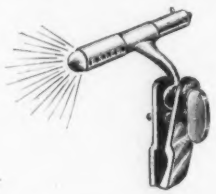
Modification of the Sluder Tonsillotome. DR. H. ARROWSMITH.

Sluder's technic has been of the greatest value in simplifying the operation of tonsillectomy. His instrument is, however, in the amount of traumatism produced, midway between the clean cut of the original Mackenzie tonsillotome and the contusing and slowly healing snare enucleation.

Several years ago, at my suggestion, V. Mueller & Co., of Chicago, changed Sluder's original instrument by slotting the ring opposed to the blade,—as in the Mackenzie tonsillotome,—by making the blade sharper and by replacing the rather flexible retaining plate on top of the blade member by a rigid T-shaped guide. This instrument has been in daily use in my clinic for several years, to the complete satisfaction of my assistants, internes and many visitors. It is easier to manipulate than the real Sluder, enucleation is quicker, less manual force is required and the traumatism is very slight. The instrument is procurable in two sizes, —⅝ and ¾ of an inch, inside ring diameter.

Illuminator for Killian's Suspension Laryngoscope. DR. ARROWSMITH.

This apparatus consists of a small but powerful lamp which is attached to the lower tooth-plate of the Killian "Spatelhaken" by means of a specially designed clamp, which in connection with a ball and socket joint allows of free movement in every direction and consequent perfect illumination of all parts of the pharynx and larynx.



A much better lighting is obtained than by any form of headlight and the operator is entirely freed from the awkwardness of trying to focus his illumination and manipulate his instruments at the same time.

This instrument has been made, at my suggestion, by the Electro Surgical Instrument Company, of Rochester, N. Y.

DISCUSSION.

DR. FREUDENTHAL said that he had tried the instrument himself and had found it worked very well.

This instrument is a little lamp. The light given by the head lamp alone is not always sufficient, and another is frequently required to help along. The German lamps recommended by Killian do not give sufficient light. Dr. Arrowsmith had this one made in Rochester. It is much stronger than the German lamps and gives a much better light. It is not in the way at all, works very well, and is simple.

Punch for the Naso-antral Wall. DR. SIDNEY YANKAUER.

Dr. Yankauer said that in operating upon the antrum through the nose he had been using a series of instruments or punches most of which were doubtless known to all present. One, made by Pfau, had been presented about a year ago; it makes a hole in the outer nasal wall and then enlarges the hole. By cutting through, one can cut either backward or forward, but it takes a very small bite. Then the series has an offset punch which cuts forward, and one can easily cut off a considerable piece in the anterior direction. Another instrument by Pfau cuts posteriorly so that the opening can be enlarged posteriorly. All of these instruments are in the market. The hole can be made with any instrument desired, and then enlarged backward or forward. The difficulty, however, has been to level the wall to the floor. No instrument that has been devised for the purpose has been found altogether satisfactory. The only way it could be done was with the chisel, which was extremely disagreeable to the patient. Accordingly he devised a punch which fits into a universal handle and which cuts downward. With this one can work quite rapidly and get well down to the floor. It is made right and left.

DISCUSSION.

DR. MYLES said that he had devised many punches for the naso-antral wall. Of course, approximately perfect instruments can be made for this purpose but he had never yet seen one that was thoroughly and generally effective. We have very efficient instruments for removing the upper two-thirds of this wall. Dr. Myles said that he hoped Dr. Yankauer had found something that was really good for removing the inferior section of the naso-antral wall.

DR. ABRAHAM said that he had no criticisms to make of the instruments presented by Dr. Yankauer, but that he would criticise forceps in general. Everyone has his own way of operating, but the simpler the instrument the better for all concerned. All the forceps that have been devised for this work are extremely complicated and very large. His own experience has convinced him that the simpler the operation and the instruments the better, and he tries to save the patient as much of the inferior turbinate as possible. Lately he has operated upon several cases and it is difficult to see where the inferior turbinate had been operated upon. The technic that he employs is simply to remove the lower border of the turbinate and open the antrum with the triangular reamer, burr and chisel. If forceps are employed it is necessary to remove about one-half of the anterior end of the inferior turbinate. The mechanism of all forceps are very complicated and expensive and in some instances require right and left and are very prone to get out of order. It also requires considerable time and patience to keep them clean and working properly. Therefore I think that any instrument that simplifies an operation and at the same time minimizes the amount of normal tissue to be removed is a preferable one.

DR. YANKAUER said that the difficulty about the outer nasal wall is that the floor of the antrum and the floor of the nose are never on the same level. In some persons one is lower, and in others, the other. With this punch he has been able to get a level floor and it has worked very well.

PHILADELPHIA LARYNGOLOGICAL SOCIETY.

(Regular Meeting, April 21, 1914.)

DR. E. B. GLEASON, Presiding.

SYMPOSIUM ON GENERAL ANESTHESIA FOR OPERATIONS OF THE UPPER RESPIRATORY TRACT.

Oil-ether Colonic Anesthesia. DR. JAMES F. GWATHMEY, New York, (by invitation).

Indications: This anesthesia is indicated in all operations on the upper respiratory tract, head and trunk; in cases of Graves' disease and similar conditions where the element of fear is a dominant factor; in fat patients; in children; in patients who have suffered nausea and vomiting from previous administrations of ether. It can be given in bronchitis and asthma, and has been given to a patient with hemorrhages from lungs with no ill effects.

Contra-indications: Whenever ether is contra-indicated it should be used except when the patient has been ill from previous administration; here it can be given with impunity. Pathological conditions of the lower bowel; colitis, hemorrhoids, fistula, etc.

Preparation of patient: The night preceding the operation, the bowels are cleared by administering castor oil; avoid purging. The following morning, irrigation of colon with warm water until return is clear; patient permitted to rest two or three hours. One hour before operation, mixture of two to four drams of ether, in which is dissolved five to ten grains of chlorotone and two to four drams of olive oil, is injected into rectum, or suppository of five to ten grain of chlorotone is inserted. Half-hour before operation, morphin ⅛ to ¼ grain with tropin 1-200 to 1-100 grain.

Mixture for adults, olive oil, ounces 2; ether, ounces 6. Mixture for weak, anemic patients, olive oil 35-45 per cent; ether 55-65 per cent. For children a mixture containing 50 per cent ether is sufficiently strong.

Apparatus: Rectal tube, one-fourth inch in diameter, twenty-eight inches long; clamp for tube; three inch glass funnel; Lockwood tube, thirty inches long and ⅜ inch in diameter; all previously sterilized.

Administration: Fifteen minutes before operation patient in modified sinus position; catheter well lubricated and inserted four inches within rectum, mixture slowly poured into funnel, at least five minutes being consumed. Introduce one ounce for every twenty pounds of body weight except for those obese; eight ounces should not be exceeded. From ten to thirty minutes is necessary before patient can be moved. Unconsciousness usually follows five minutes after completion of injection; narcosis complete five to ten minutes later, when delayed few whiffs of chloroform allowed. After patient receives mixture anesthetist must maintain clear air passage. Patient never left alone at any time after receiving injection. Then directions important because internes in our hospitals know less regarding administration of anesthesia than any sin-

gle subject, simplicity may lead to belief that no particular care necessary.

Danger signals: Loss of lid reflex, stertor or embarrassed respiration; approaching cyanosis. If breathing is regular, with reflexes active, patients will relax in surgical narcosis. If any of the above symptoms appear, portion or whole of mixture may be withdrawn, and if symptoms persist irrigate with cold, soapy water; if necessary stretch sphincter and resort to all recognized methods for restoring consciousness.

Post-operative: Immediate irrigation of colon with cold water soap suds; then withdraw one of the tubes from rectum and introduce two to four ounces of olive oil and one pint to quart cold water; withdraw tube from rectum. Patient recovers consciousness from fifteen to thirty minutes following procedure. Olive oil-ether mixture has now been successfully administered upwards of 300 times.

Intra-tracheal Insufflation Anesthesia. DR. GEORGE P. MUELLER (by invitation).

Intra-tracheal insufflation anesthesia began with publication of Meltzer's paper in 1909. Later Elsberg devised an apparatus for use in human beings. Shortly after the introduction of the method it was found especially applicable to surgery of the head, mouth and throat; it enables the operator to work unhampered by the presence of an anesthetist and in cases of operation on mouth, the constant back-stream of air prevents blood or mucus from falling into the trachea.

It is not necessary to dwell on the physiologic principle involved; a steady stream of air delivered at the bifurcation of the trachea suffices, when respiration continues to aerate lungs; if respiration is stopped by elevation of pressure, the stream of air is interrupted every twenty seconds to permit diffusion currents to circulate through lungs. With air ether is mixed to anesthetize the patient.

The principle of intra-tracheal insufflation anesthesia is different both from positive and negative pressure. The apparatus exhibited has been used in University Hospital for about a year with eminently satisfactory results. At first a copy of Dr. Elsberg's model was used; later it was altered to suit Dr. Mueller's ideas; finally he had present apparatus made. The doctor's experience extends over two years; about 170 patients have been anesthetized with the one or the other models. The apparatus was primarily constructed in the hope that a moderate-priced, reliable instrument could be produced which would enable the surgeon to use this method of anethesia in thoracic operations as well as for anesthesia in operations on head, mouth and throat. The air-stream is furnished by a blower and electric motor. Air is then filtered of oil or dust and delivered into a glass air chamber. In this is a cone or finger, heated by electric current, on the top of which ether is dropped by means of a needle valve and ether reservoir. Amount of ether can be regulated at will and vaporization aided by heat. Heater can be made to serve two purposes, one of vaporizing ether and the other of warming air if it is believed that warm ether vapor is essential. After leaving the mixing chamber the vapor is again filtered to remove droplets of ether and passes

through tubes to trachea. There is a manometer attached to register pressure and a mercury safety valve which can be set at any pressure and which will blow off if this pressure is exceeded.

He has followed the same technic in introducing the catheter as advised by Peck, Elsberg and other writers on subject. Anesthesia produced is so satisfactory, safe, and easily controlled that Dr. Mueller would anesthetize many more patients by this method than he does were it not for the dislike of introducing the tube through vocal cords into trachea. A number of our patients have complained of sore throat, but this is mostly due to faulty technic in inserting tube; those with the most experience in introduction have least trouble with pharyngitis. He has never seen a case of bronchitis or pneumonia that could be attributed to the tracheal tube. But one case of pneumonia and two or three of bronchitis; this is less than the average seen in ordinary anesthesia. The method certainly lessens the shock and makes for an easier post-operative recovery from ether. He has had no experience with the naso-tracheal method advocated by Robinson.

This method is only applicable to cases where it is desired to use intra-tracheal insufflation anesthesia and where the presence of the tube in the mouth is objectionable to the operator. The method consists in introduction of rubber tube into trachea; then by means of another rubber tube or Belocq canula the first one is drawn backward into the pharynx, thence through the nose. He has used pharyngeal insufflation a great deal, especially in those cases in which it was desired to get the anesthetist out of the road of the operator, but where it did not seem necessary to introduce the tracheal tube. In practice of this method one must always introduce tubes accurately, i. e., they should be introduced exactly the distance as measured from ala of nose to external auditory meatus. This will make them protrude sufficiently into the naso-pharynx but will not allow them to be gripped by the esophagus. It is also important not to attempt insufflation unless swallowing-reflex has been abolished by preliminary anesthesia in ordinary manner.

Finally, while Dr. Mueller is very enthusiastic about intra-tracheal insufflation anesthesia owing to his own experience with the method he does not wish to appear as its advocate to the exclusion of other methods of anesthesia. It is invaluable in surgery of the thorax, indispensable in the surgery of the mouth, especially for cancer of the tongue, lip and jaws; it is very useful in operations upon the cranium, head, neck and spine. In the latter, the recumbent position of patient interferes with respiration but such interference is of no moment with insufflation tube in place.

Chloroform Anesthesia. DR. CHARLES P. GRAYSON (by invitation).

Dr. Grayson felt that anything he might say, favorable to chloroform as a general anesthetic would have little more than an abstract or academic interest. Probably very few of those present used it and he would regret if anything he might say would induce them to experiment with it. Neither should his remarks in favor of it be interpreted as an attempt to persuade others to give it a trial. Two years ago in Philadelphia at the Annual Meeting of the American Laryngological Association Dr.

Grayson gave his experience with chloroform during the preceding eight years; under his personal supervision it was administered to some 3,800 patients. Two years of private and hospital work has brought the number up to 5,000. In discussion of the paper referred to, the doctor was subjected to the severest criticism and he said that many well-meant but terrifying warnings were hurled at his head. He was told of deaths that had occurred in the experience of certain fellows, which, of course, had been wholly attributed to chloroform.

In one way Dr. Grayson is disappointed in chloroform; before he began to employ it he was led to believe by all he had read and heard of it, he was going to be in a state of constant fear and excitement because of its treachery. If all those things were true he would probably have found them out in the ten years he has been using it but so far from being true he would say without hesitation, within the limitations of his own experience, they have proved absolutely without foundation. He has administered it to the infant of a few weeks old, to adults in their seventies and to men, women and children between the extremes of age, in a score or more cases of valvular insufficiency, and to at least a dozen cases exhibiting supposed clinical evidence of that dubious condition known as the "status lymphaticus" and he is still waiting for that loudly and confidently predicted case of sudden cardiac paralysis.

Are we inclined to accredit this to luck? Dr. Grayson has never for one minute permitted luck to play any part in his dealings with chloroform and is just as, if not more careful, in its administration than he was ten years ago, and from the first drop to the last the patient is under his constant observation. Chloroform will not permit the same careless liberties to be taken with it as one may take with ether, but the same thing is true of cocain as compared to eucain or stovain, or of morphin to paregoric, or of strychnia as compared to nux vomica, but we do not abandon cocain, strychnin and morphin simply because of the greater care their use demands, do we?

There is nothing about chloroform that is treacherous; it barks and barks loudly and threateningly before it bites and, if finally goaded into biting, the man who is bitten thoroughly deserves his wound. Dr. Grayson prefers chloroform because if properly given and taken it is a distinctly pleasant anesthetic, it occasions no irritation of the upper air tract and within two or three minutes the patient passes into a quiet anesthetic slumber from which he quietly and quickly emerges upon completion of operation. No post-operative vomiting, often not even a sensation of nausea. Hemorrhages both during and after operation much less than with either nitrous oxid or ether, and it is not at all unusual for the child to be asking for food before half an hour is past. Nothing would induce Dr. Grayson to administer chloroform if the patient, his family or his medical attendant were suspicious or timid about this anesthetic because his faith and regard for it are so great that he would be afraid in case of accident some of these people would shortsightedly blame chloroform instead of some fault of his in its administration.

Ether Anesthesia. Dr. Robert F. Ridpath.

The doctor confined his remarks to the method and instrumentality used at operations and in the clinic at the Medico-Chirurgical Hospital. Apparatus used is the Rupert modification of the Cain-McDermott and consists of nicked hot-water container having cross-bars for insertion of ether bottle. Another or smaller bottle is attached to side of water-container and acts as safety valve for any overflow of pure ether. These two bottles are connected by tubing, the distal ends of each having on a larger bottle or ether reservoir, bulbs as here shown, first to force air, second to keep more even pressure than would be possible otherwise. Distal end of small bottle has delivery tube connecting it on which is the mouth-piece.

A few drops of an alcoholic solution of oil or bitter orange is placed on gauze and the patient allowed to inhale for a few minutes; then ether is gradually dropped, the ether and orange odors blending and forming a pleasant mixture which the patients have frequently said was better than plain ether vapor. Ether is gradually increased until patient enters secondary or excitant stage when it is pushed until third or complete anesthesia is reached. The mouth-gag is now inserted and any secretion in the mouth of the pharynx wiped out. Then insert mouth-piece of delivery tube into side of patient's mouth, allowing gauze which still has ether added to it to remain over patient's mouth, and start ether vapor apparatus. The point he wishes to make here is this, that it is advantageous to change from one form of delivery to other gradually, viz: by still allowing gauze to remain over nose and mouth, adding ether to gauze, but in lessened quantity than before, until the patient although anesthetized overcomes the laryngeal spasmodic contraction which invariably takes place at the beginning of giving pure ether vapor.

It will be found that a greatly lessened quantity of ether is necessary to keep the patient in an anesthetized condition by this method than by any other Dr. Ridpath has tried. Anesthetists, if new with this method, must therefore be cautioned against pushing ether too hard. The best results are obtained by having ether bottle of container not over half full, as the bubbling which takes place when air is forced through ether is apt to overflow into small safety bottle.

Ether, whether liquid or vapor, is very susceptible to change or variations of temperature, and although we use small bottle to catch overflow we nevertheless do have on occasions some liquefaction in delivery tube, patient for moment receiving pure ether, instead of vapor. This is easily remedied by simply allowing tube to cleanse itself by dropping it towards floor.

Superheated Ether Vapor with Oxygen. Dr. Frank Hill (by invitation).

DISCUSSION.

Dr. Fielding O. Lewis: Dr. Gwathmey's paper was of great interest to me. On account of fear, often a serious factor in general anesthesia, I believe oil-ether administration to patient in bed would be a distinct advantage. My experience has been mainly confined to the use of straight ether by the drop method. It is interesting to hear Dr. Grayson uphold

the use of chloroform, and his experience of 500 administrations without accident is indeed impressive. Chloroform is seldom used at Jefferson Hospital; it is six times more dangerous than ether. I have recently witnessed a labyrinth operation under chloroform which was satisfactory from every view-point; recovery from anesthetic was very prompt.

Dr. Benjamin D. Parrish: The papers of this symposium must have impressed upon the minds of all the growing necessity of hospitals having upon their staffs skilled and efficient anesthetists. A resident physician wtih the very inadequate preliminary training in anesthesia has no license to undertake the handling of intricate apparatus, nor should the choice of anesthetic to be used be left to the novice. The efficiency of the operator is reduced 50 per cent if he has not perfect confidence in his anesthetist. Statistics as to the relative safety of ether, chloroform and other agents are unquestionably open to grave fallacies and must be accepted with caution. So-called deaths under anesthetics are often deaths partly or wholly attributable to other causes than the influence of the anesthetic itself, and, conversely, fatalities which should be properly ascribed to anesthesia are often either never reported or regarded as due to surgical shock, etc.

The personal element in any given series of cases or methods is often not taken into account. Desperate cases are often regarded as unsuitable for chloroform; ether is chosen for them with the result that ether death is thereby unfairly increased.

Statistics undoubtedly have their value, whilst they may be regarded as roughly indicating the relative risks of ether, chloroform, nitrous oxid, etc., they cannot be accepted as representing the true relative death rates. However, with an assortment of anesthetics, patients and operation, ether has proved about six times as safe as chloroform.

The preliminary use of morphin and atropin in adults and atropin alone in children has to a great measure in my cases removed one great drawback to ether. The ether-vaporizer has become of almost universal use among laryngologists, yet after several years' trial Dr. Parrish has discarded it in the cases of young children, after having one or two alarming cases of acidosis with persistent vomiting. Here again we encounter the drawback to most apparatus, the inability to accurately gauge the amount of anesthetic used, and the tendency of the inexperienced anesthetist to push the administration to the limit.

In my hands the gas-oxygen ether sequence has given the most satisfaction, the Gatch apparatus being used. Nitrous oxid and oxygen alone does not keep the patient under long enough after the removal of the mask to operate on the tonsils unless possibly the Sluder technic be used and merely a tonsillectomy be performed. This combination answers well for removal of adenoids because of its ranking as least dangerous of all anesthetics. On several occasions I have performed the simple mastoid operation on adults with nitrous oxid and oxygen alone, the only difficulty experienced was oozing of blood darkening the field of operation, and in one case of perisinus abscess rendering the meninges hard to recognize from granulations.

The demonstration of colonic anesthesia which Dr. Gwathmey so ably gave was first one I had witnessed. All who were present must have been struck with the facility with which the oil-ether mixture was administered, the rapidity with which anesthesia was produced without any marked stage of excitement and complete relaxation of patient. Rectal etherization was first suggested by Roux in 1847, Perigoof using it the same year; Dr. Weir (*N. Y. Medical Record*, April 28, 1884,) reported one death from rectal etherization. Dr. W. T. Bull, May, 1884, published seventeen cases in which melena occurred in several. Dr. Gwathmey has practically eliminated the danger of intestinal hemorrhage by the use of oil as a menstrum.

It is unfair to judge from one demonstration just what is to be expected of any method. There was no means of gauging the pharyngeal or laryngeal reflex because operation was one for a hernia. The inability to quickly restore reflexes is a great drawback in bloody operations about the upper respiratory tract. The period of prolonged analgia and after-stupor is not to be desired in operative work on the respiratory tract. The apparent ease of administrating this method may lead to some grave results if tried by the casual onlooker. The fact that body weight, age and pathological condition of the intestinal tract and kidneys are of vital importance, should not be lost sight of.

Dr. William L. Rodman said he was particularly indebted to Dr. Gwathmey for demonstration of his method of colonic anesthesia at the Medico-Chirurgical Hospital. It was the first time this method had been employed in Dr. Rodman's service and it worked admirably. The patient was a fat man; relaxation complete; disagreeble symptoms entirely wanting. Dr. Rodman has had no experience with the intra-tracheal method of anesthesia as demonstrated by Dr. Mueller. It is perhaps the very best method in certain cases and it has come to stay. The doctor was charmed with Dr. Grayson's courage in the use of chloroform. Superiority of chloroform to ether in every possible way was demonstrated by Hunter McQuire, the elder Gross and other distinguished surgeons of that time. Personally, Dr. Rodman has had a large experience with chloroform and during the first fifteen years of his practice used it many more times than ether, with never a death. They get off the table all right; no bronchitis or pneumonia; no vomiting.

Great injustice has been done to chloroform. The indications for its administration are definite—children, obstetrics, brain surgery, to avoid hemorrhage. All have not the courage of Dr. Grayson and often defer to public opinion. Dr. Rodman has taken chlorform and it has been administered to a number of his family. In the hands of an experienced person chloroform is as safe, if not safer, than ether. Dr. Rodman is familiar with the method described by Dr. Ridpath; he has often seen it used in Dr. Skillern's clinic. Dr. Rodman advocated the preliminary use of essence of orange.

Dr. E. Matlack: In three operations, namely, mastoidectomy, cerebellar abscess and Caldwell-Luc, the oil-ether method was used with entire satisfaction.

(To be continued.)